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ADDRESSES AND ORIGINAL ARTICLES

GASTRO-JEJUNO-COLIC FISTULA, WITH MEGALOCYTIC ANÆMIA SIMULATING SPRUE.

By N. Hamilton Fairley, O.B.E., M.D., D.Sc. Melb., F.R.C.P. Lond.,

Assistant Physician and Director of Pathology, Hospital for Tropical Diseases, London; Lecturer in Clinical Medicine and Applied Pathology, London School of Hygiene and Tropical Medicine;

AND

T. Pomfret Kilner, M.B. Lond. & Manch., F.R.C.S. Eng.,

Surgeon to the Hospital for Tropical Diseases.

Gastro-jejuno-colic fistulæ usually originate from cancer of the stomach or colon, or follow the operation of gastro-enterostomy. Verbrugge, who reviewed the literature up to 1925, found that 202 cases of gastro-colic and jejuno-colic fistula had been recorded, and added 14 more cases from the Mayo Clinic. The chief clinical features in this series were marked wasting without apparent cause, abdominal discomfort or actual pain, eructations of foul gas, fæcal vomiting without evidence of obstruction, and intermittent diarrhœa. Finally, a syndrome of colonic obstruction was not uncommon, especially where the patient had previously undergone a gastric operation. It is interesting to note that anæmia per se did not attract special attention, and it is particularly from this viewpoint that the present cases are recorded.

Diarrhœa, which was often the first manifestation, was also the most constant clinical feature. The bowels generally acted two to three hours after food and often at night, and there were not infrequently 10 to 12 evacuations in the 24 hours. In appearance the stools were usually yellow in colour and acid in reaction, owing to the presence of fatty acids or hydrochloric acid. Strauss (1921) says that fatty stools are an early feature, and both he and Arons (1922) have stressed the importance of searching for fæcal fat in suspected cases. Undigested food in the fæces is much less frequently encountered than would be expected. Diagnostic aids include the use of colour meals, which appear rapidly in the stools, and radiography after a barium meal. The latter, however, is by no means invariably diagnostic, and Camp (1930) holds that gastro-jejuno-colic fistula may only be discernible by means of the opaque enema.

Under a grant from the Colonial Medical Research Council a special investigation on sprue is being undertaken at the Hospital for Tropical Diseases, Endsleigh-gardens, and owing to this fact the two following cases, which were in the first instance erroneously regarded as atypical and complicated sprue, have been worked up in considerable detail. Of special interest is the demonstration of gastro-jejuno-colic fistula associated with definite megalocytic anæmia responding adequately to liver extract and high protein diet, while the biochemical findings, being partly at least dependent on malabsorption, afford an instructive comparison with those met with in sprue.

The First Case.

A rubber planter, aged 42, was admitted to the Hospital for Tropical Diseases on Feb. 14th, 1930.

He had resided in Malaya for 20 years where occasionally he had slight attacks of malaria. There was a history of an appendicectomy in 1914, and of a gastro-jejunostomy for pyloric obstruction in March, 1926. For two or three months before the latter operation there was copious vomiting after meals; on occasions he had himself washed out his stomach to get relief. He described the vomitus as being so acrid that it would literally "kill grass." Though he improved considerably and reached 9½ st. after this operation, he has never felt really fit since, always having to be careful with his diet; pork and curry especially have caused acute abdominal discomfort.

The present illness commenced with diarrhœa in October, 1929, the bowels being opened seven to eight times daily, usually between midnight and 4 A.M. The stools were watery, light-brown, frothy, and foul. Lingual features were not troublesome, but his doctor in Malaya commented that his tongue was characteristic of sprue. Flatulence was at times present, but not indigestion. In Malaya the condition was diagnosed as sprue, and the patient was treated with milk diet, calcium, and parathyroid. The diarrhœa ameliorated under this régime and the stools became white and hard, but five weeks later it returned, 10 to 15 stools being passed in the early morning; there was ineffective control of defæcation. Meat treatment was now instituted and improvement followed, the motions decreasing to three to four daily, and being less white and frothy. On Jan. 17th, 1930, the patient sailed for England, but he relapsed on board ship following a meal of mushrooms and chicken. The bowels acted some ten times daily for six days.

On admission to hospital he complained of weakness, morning diarrhœa, flatulence, and loss of weight, from 10 to 8 st.

EXAMINATION.

He was pale and emaciated. The tongue was clean, very red and fissured on the dorsum, but the fungiform and filiform papillæ were not atrophied.

Thorax.—Nothing abnormal was noted in the heart or lungs. The blood pressure was low, 85 systolic, 53 diastolic.

Abdomen.—The scars of two previous abdominal operations were present, and the abdominal parietes were very wasted. Abdominal distension was present, and coils of small intestine were readily felt on palpation, while in the epigastrium, mid-way between the xiphoid cartilage and the umbilicus, a tender spot, not hyperæsthetic to pinprick, was elicited.

SPECIAL INVESTIGATIONS.

Urine had a specific gravity of 1010, was acid in reaction, and contained no albumin or sugar.

Fæces were negative for ova and protozoa. No mucus or cellular exudate was present.

Blood.—Red cells, 3,600,000 per c.mm.; hæmoglobin, 65 per cent.; colour-index, 0·9. The blood picture showed anisocytosis and poikilocytosis.

Blood chemistry.—The van den Bergh reaction showed a negative direct and indirect reaction. Blood calcium, 8·0 mg. per 100 c.cm.

Fractional test-meal (Feb. 17th).—The fasting juice was of normal appearance and contained no charcoal residue. Its free acidity was 28 N/10 HCl. Following a gruel meal there was a rapidly ascending curve of acidity, the high maximum of 120 N/10 HCl being attained. As judged by the starch reaction the stomach emptied in two hours. Following histamine injection the acidity reached 125 N/10 HCl (Fig. 1).

Wassermann reaction was negative.

Dr. Rowden White reported as follows:—

Radiological report.—"Opaque meal. Gastro-jejunostomy stoma patent, the stomach emptying rapidly. There was general dilatation of the small bowel, especially in the loop below the right hypochondrium. No definite evidence of jejunal ulcer. The appearance of the bowel was consistent with the diagnosis of sprue, but the possibility of an obstructive lesion such as a band compressing the small bowel must be watched for."

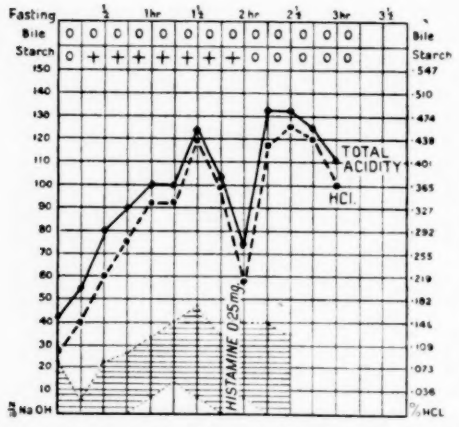
Fæcal fat (Feb. 22nd).—The stool was pale and of bulky, ill-formed consistency, slightly alkaline in reaction. Some soaps and partially digested muscle-fibre were present. Fatty acids, 25·0 per cent.; neutral fat, 8·9 per cent.; total fat, 33·9 per cent., of which 73·86 per cent. was split, and 26·14 per cent. was unsplit.

PROGRESS UNDER TREATMENT.

The intense hyperacidity and history of previous operation suggested a recurrent or jejunal ulcer, but the absence of hunger pain and dyspepsia, and the negative nature of the radiographic findings, did not support this view. As the clinical picture closely approximated to that of sprue the diagnosis made in Malaya was accepted.

The patient was put on the standard high-protein, low-fat, low-carbohydrate diet (Fairley, 1930), combined with full doses of liver extract (six ampoules Eli Lilly No. 343 = 1½ lb., daily) and calcium lactate per os. Under this régime the general condition markedly improved, and the blood picture returned to normal. Thus on March 25th the red cells were 4,900,000 per c.mm., the hæmoglobin 85 per cent., and the colour-index 0·87. The blood calcium rose to 9·8 mg. per 100 c.cm., and the blood phosphorus was

FIG. 1.



CASE 1.—Intense hyperacidity with jejunal ulcer and gastro-jejuno-colic fistula, before operation.

4·2 mg. per 100 c.cm. The stools also became brown, hard in consistency, and were normal in all respects except that analysis showed a high fat content, the report on April 2nd being as follows: "Stool was hard, formed, pale brown in colour, and alkaline in reaction; partially digested muscle-fibres were present. Fatty acids, 33·96 per cent.; neutral fats, 10·79 per cent.; total fat, 44·75 per cent., of which 75·9 per cent. was split, and 24·1 per cent. was unsplit."

During this treatment the patient lost 1 lb. in weight, and had at times troublesome gastric and intestinal flatulence associated with transient attacks of abdominal distension; he stated, however, that he felt very fit, and as the bowels were acting normally and he was anxious to carry on treatment in Scotland, he was discharged as relieved on April 3rd. He remained ten days in Scotland, but as the weather was very cold he returned south to Bournemouth. There the motions became more frequent, two to three being passed in the early morning. There was no abdominal distension or flatulence, but 5 lb. were soon lost in weight.

He was readmitted to hospital on April 30th; apart from anæmia the physical findings were similar to those already described. Blood pressure, 82/55; red cells, 3,400,000 per c.mm.; hæmoglobin, 70 per cent.; colour-index, 1·0; and the average diameter of the corpuscle, 7·8 μ. The glucose-tolerance curve was normal. The patient was again put on a high-protein, low-fat, low-carbohydrate diet, liver extract (full dosage), and calcium.

The following dated notes indicate further progress:—

May 15th.—For two days periodic attacks of epigastric pain had occurred not definitely related to meals, but relieved by changing posture. Three large stools were passed in the last 24 hours; they were malodorous and semi-fluid, and contained undigested food particles. Flatulence was also marked. Physical examination showed some tenderness in the epigastrium about 2½ inches below the xiphoid process.

May 23rd.—After a dose of tincture of belladonna, ℥ xv., the patient developed severe epigastric pain at 9 A.M., which culminated in precipitous vomiting of greyish, semi-fluid, foul fæcal material containing a little mucus. At 10 A.M., 11.30 A.M., and 12 noon the patient vomited similar material, the total quantity amounting to nearly three pints; belching of foul flatus also occurred. The patient, however, was in no way shocked, and he took his usual lunch and tea without discomfort. It was now ascertained for the first time that during his last stay in hospital fæcal belching had occurred, though he had never reported its occurrence; it was particularly marked after the last meal in the evening, and relief often followed the evacuation of a large stool. A diagnosis of gastro-jejuno-colic fistula was now made, and operation advocated. Pre-operative treatment included the administration of glucose in large quantity and insulin.

OPERATION.

On May 26th the abdominal cavity was opened by excision of right paramedian scar of previous operation. Adhesions to the anterior abdominal wall were separated, and the site of the gastro-jejunal anastomosis was isolated. A large inflammatory mass involving stomach, jejunum, and transverse colon was discovered. Gentle separation of the parts opened up a large ulcer near the point at which the efferent loop of the jejunum turned downwards and exposed a large defect in the wall of the transverse colon. The jejunal wall was so extensively involved in the inflammatory condition that its separation resulted in almost complete transverse division.

The opening in the colon was closed by two layers of sutures, the line of these being placed transverse to the long axis of the bowel in order to avoid subsequent constriction. The stomach opening was trimmed where its margin was necrotic, and was closed in similar manner after examination of the pyloric region had made sure that no signs of ulceration or stenosis were present. The continuity of the jejunum was re-established by simple end-to-end anastomosis. A large drainage-tube was inserted, and the abdominal wall was closed in layers.

POST-OPERATIVE PROGRESS.

Despite the extensive nature of the operation and the low initial blood pressure the patient did not appear unduly shocked, but for the next three weeks a remittent temperature developed, varying between 99·2° F. and 101° F. For the first three days up to 2000 c.cm. of a 5 per cent. glucose solution was daily administered intravenously.

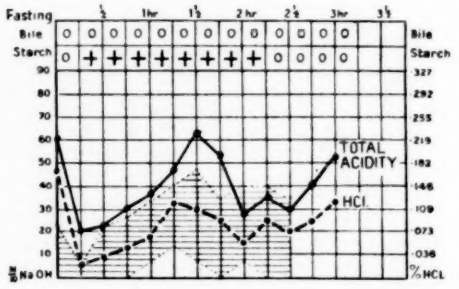
May 29th.—Albumin water (1 oz.) was allowed two-hourly. A foul, brownish-grey fæcal discharge containing gas bubbles now appeared from the original tube, which was replaced by one of smaller diameter.

May 30th.—A transfusion of 520 c.cm. of citrated blood was given: the progress of the anæmia may be studied in Fig. 1.

May 31st.—The patient was now placed on milk and Benger's food; glucose was administered in all drinks. Intravenous glucose was discontinued.

June 2nd.—The patient was given chicken and vegetable soup, and eggs were also allowed.

FIG. 2.



CASE 1.—Normal curve of acidity after operation.

June 4th.—The bowels began to act normally and Parke, Davis's ventriculin (two tubes daily, i.e., 20 g.) was given, as well as alkaline powders half an hour after each hourly feed.

June 6th.—There was still a copious discharge of brownish fluid from the fistula. From this date onward the patient progressed satisfactorily. Two-hourly feeds (3 oz.) of milk thickened with cornflour, thick Benger's food, junket and custard were given. Eggs and pounded fish were also allowed, as well as toast. Alkaline powders were continued.

June 17th.—There was but little discharge, and the tube was taken out. The blood pressure was 100/60.

June 18th.—The patient, who was very much better, was eating satisfactorily and did not complain of abdominal discomfort. Tea, sponge cakes, chicken, tripe, milk puddings, and jelly were now added to the menu.

June 20th.—The stool was dark and formed, with an alkaline reaction; microscopical examination revealed soap plaques. Analysis showed fatty acids 17 per cent., neutral

fat 29·25 per cent., and total fat 46·25 per cent., of which 36·7 per cent. was split, and 63·3 per cent. unsplit.

June 28th.—The discharge from the sinus had practically ceased.

July 4th.—A fractional test-meal (Fig. 2) showed great improvement. The fasting juice was normal except for a high-grade acidity, 50 N/10 HCl. There was no evidence of charcoal retention. The curve of acid secretion was normal, and the stomach emptied in approximately two hours. A secondary rise occurred after this, the acidity reaching a maximum at three hours of 35 N/10 HCl. Blood calcium, 10·0 mg. per cent.; blood phosphorus, 3·3 mg. per cent.

The radiologist's report was as follows:—

July 8th.—"An opaque meal showed that the stomach was dilated and hypotonic. There was some persistent irregularity of outline in the prepyloric region probably due to adhesions. At three hours stomach residue was present; most of the meal was massed in the ileum on the left side of the abdomen. At six hours stomach residue was still present; the cæcum and ascending colon were filled. There were some isolated dilated coils of ileum. At 24 hours stomach residue was still present; the cæcum and transverse colon were filled.

"*Commentary.*—The gastro-jejunostomy has been undone, and the stomach now shows delayed emptying. Evidences of small bowel adhesions are present."

On July 10th the patient was discharged from hospital; now his weight was 9 st. 3 lb.—a gain of 2 st. since operation. The blood counts, too, were almost normal—i.e., red cells, 4,500,000 per c.mm.; hæmoglobin, 70 per cent.; colour-index, 0·8. There was no abdominal discomfort, the fistula had closed, and the abdominal incision completely healed.

Six months later the patient reported back to hospital in perfect health, his weight now being 13 st. During the interval he had kept on alkaline powders and Alvarez's smooth ambulatory diet.

The Second Case.

A sea pilot, aged 49, was admitted to the Hospital for Tropical Diseases on June 3rd complaining of weakness for the past four months.

Since 1908 he had been stationed in Rangoon except for a period of four years from 1916–1920, when he was located in Mesopotamia. In the tropics he had suffered from dengue, sandfly fever, and malaria.

The present illness started in February, 1930, with griping pains in the upper abdomen, and an afebrile diarrhœa characterised by pale, fluid stools. For some little time previous to this date, however, he had not been feeling as well as usual. After six days' rest in bed the stools became normal, and the patient returned to duty, though he was still somewhat anæmic, the red cells 4,190,000 per c.mm., the hæmoglobin 65 per cent., and the colour-index 0·8. The blood picture showed slight anisocytosis and polychromasia. Leucocytes were 7800 per c.mm. He was treated with liver extract, iron, and arsenic, and recovered within three weeks, his illness at the time being attributed to food poisoning. On the third week in March, 1930, large, soft, putty-coloured motions reappeared: the diarrhœa generally started about 5.30 A.M., and during the next four hours three to four stools would be passed, after which there would be no action of the bowels until next morning. Abdominal discomfort, relieved by flatulence, was a feature of this illness.

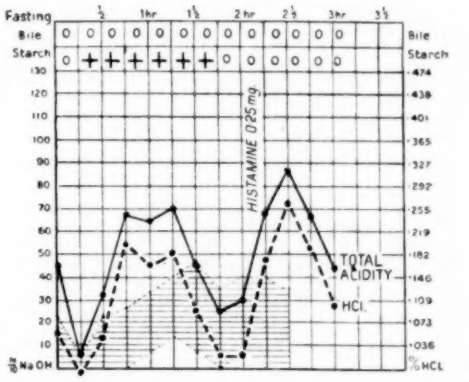
About this time the patient became appreciably weaker and more anæmic, and a blood examination was made in Rangoon by Colonel J. Taylor, I.M.S. The red cells were 3,130,000 per c.mm., hæmoglobin 77 per cent., and the colour-index 1·2. He was put on a milk and fish diet, with hydrochloric acid and liver extract (two tubes, ½ lb., daily), and during the next three weeks he piloted a boat. Gradually, however, he became worse, his appetite decreased, and he developed a sore mouth and tongue which presented red streaks down the centre and aphthous blisters posteriorly. Hot fluids caused a burning feeling in the throat and behind the sternum, and alcoholic drinks caused pain. The blood examined on April 23rd showed red cells 2,640,000 per c.mm., hæmoglobin 64 per cent., and colour-index 1·2. The blood picture showed polychromasia and numerous megalocytes; the halometer measurements indicated a megalocytic anæmia.

Up to the time of leaving Rangoon on May 1st he had lost 3 st. in weight, and for the first two weeks on the return voyage there was an evening temperature, and ill-defined abdominal pain which sometimes kept him awake at night. Abdominal distension had been present for some time past, but there was only one loose motion daily until May 25th, when he had an attack of vomiting and violent diarrhœa with putty-coloured motions. Later the condition improved, he gained 5 lb. in weight, and at the time of admission to hospital he was passing only one light-coloured, formed stool daily. The appetite, however, had not improved.

EXAMINATION.

The patient was still fairly well nourished, weighing 12 st. on admission as compared with a usual weight of 14 st. 9 lb.

FIG. 3.



CASE 2.—High acidity with gastric carcinoma and gastro-jejuno-colic fistula, before operation.

The skin was slightly yellowish in colour, of elastic consistency, but not rough and dry, as is so frequently observed in sprue.

Eyes.—The conjunctivæ and the discs were pale, but showed no other abnormality.

Tongue.—The tongue was moist with a thin, whitish fur on the dorsum, except for a clean central area where there was slight papillary atrophy. The gums were healthy.

Chest.—There were scattered rhonchi throughout both lungs, and systolic murmurs were present at all areas over the heart, the apex-beat of which was in the fourth inter-space 3½ in. from the mid-line. Blood pressure 132/72. Radiographic examination of the heart and lungs was normal.

Abdomen.—On palpation the abdomen showed neither tenderness nor rigidity; the sigmoid was palpable in the left iliac fossa. The lower edge of the liver was just palpable on deep inspiration; radiographic examination showed no enlargement. The other abdominal organs appeared normal.

Œdema of the feet and lower third of the legs was present. No enlarged lymphatic glands were detected. Rectal examination and examination of the nervous system revealed no abnormality.

SPECIAL INVESTIGATIONS.

Urine.—Specific gravity 1016, reaction acid, no albumin, no sugar.

Fæces.—Negative for ova and protozoa on four occasions.

Blood.—Red cells 2,900,000 per c.mm., hæmoglobin 40 per cent., colour-index 0·7, average diameter of red cells 8·4 μ. The blood picture showed marked anisocytosis, poikilocytosis, and polychromasia. Numerous megalocytes were present. Leucocytes 20,000 per c.mm. The differential count was as follows: neutrophiles, 82 per cent.; lymphocytes, 15 per cent.; large mononuclears, 3 per cent.

Wassermann reaction.—Negative.

Blood chemistry (June 4th).—Blood calcium, 8·4 mg. per 100 c.cm.; inorganic phosphorus, 2·7 mg. per 100 c.cm. Van den Bergh reaction, both direct and indirect reactions negative.

Fæcal analysis (June 4th).—The stool was bulky and pale, and gave a slightly acid reaction to litmus. Microscopical examination showed a few soap plaques. Fatty acids, 34·3 per cent.; neutral fat, 13·1 per cent.; total fat, 47·4 per cent. Of this 72·3 per cent. was split, and 27·7 per cent. was unsplit. Analysis thus showed a definite excess of total fat with adequate splitting.

Fractional test-meal.—A fair sample of fasting juice was not obtained, but free acid was present (16 N/10 HCl). The ordinary fractional curve showed that acid secretion

approached the upper range of normality, a rise of 54 N/10 HCl being obtained. There was an adequate response to histamine, 72 N/10 HCl being recorded. According to the starch test the stomach was emptied in one and a half hours (Fig. 3).

TREATMENT AND PROGRESS.

On admission to hospital the megalocytic nature of anæmia suggested that the diagnosis lay between Addisonian pernicious anæmia and sprue, but the presence of adequate HCl in the stomach and the negative indirect van den Bergh readings made the former diagnosis highly improbable. Morning diarrhœa characterised by fatty, putty-like stools, lingual features, marked flatulence, asthenia, and loss of weight taken in conjunction with the results of fat analysis and the low blood calcium suggested sprue, while the atypical features such as the high acidity, the slight pyrexia, and the marked leucocytosis were attributed to superadded intestinal ulceration which does occasionally occur in this disease. The patient was treated accordingly, put on a high-protein, low-fat, low-carbohydrate diet and liver extract, three tubes daily (= ¾ lb. liver). The response to this treatment was not satisfactory, though the stools temporarily improved and the diarrhœa lessened, at times completely disappearing.

The following dated notes indicate the subsequent history:—

June 23rd.—Patient had lost 6 lb. since admission, and the blood count showed practically no improvement. The red cells were 3,000,000, hæmoglobin 40 per cent., colour-index 7·0, and the diameter of the corpuscle 8·4 μ. Leucocytes, 15,000 per c.mm.; 77 per cent. were neutrophiles.

June 24th.—The patient was transfused with 320 c.cm. of blood; a severe rigor followed. Next day the blood calcium was found to be 9·2 mg. per cent., and the blood phosphorus 2·9 mg. per cent.

July 5th.—The patient complained of abdominal distension and nausea, associated with pain in the region of the liver. The blood pressure was 130/65. The blood count on the preceding day had reflected slight benefit from transfusion, the red cells being 3,100,000 per c.mm., and the hæmoglobin 44 per cent., while the average diameter remained at 8·4 μ.

July 30th.—The patient was not progressing satisfactorily, and was still losing weight, though the blood condition had markedly improved. The red cells were 4,200,000 per c.mm., hæmoglobin 60 per cent., and the diameter of the corpuscle 7·8 μ.

August 11th.—During the past three weeks the patient had gone steadily downhill, and it was obvious that, despite blood restoration, he was failing to respond to treatment since he was 16 lb. lighter than on admission to hospital. The appetite was poor, sleep was inadequate, and the abdominal pain was increasing in severity. The blood count, however, maintained a satisfactory level, being the same as on July 30th. The leucocytes were 13,000 per c.mm., neutrophiles 75 per cent., lymphocytes 21 per cent., large mononuclears 3 per cent., and eosinophils 1 per cent. Blood-clot was now noticed in the fæces for the first time.

Dr. Martin Berry reported on a barium enema as follows:—

August 14th.—"Initial spasm appeared in the pelvic colon; when relaxation ensued both the sigmoid and the rectum were dilated. The transverse colon was not properly filled by the enema though there appeared to be opaque material in the jejunum. Four hours later the ascending colon was still full, and there was a mass of opaque material in the ileum. At 24 hours the ascending colon was still filled. The initial delay in the pelvic colon was regarded as being due to spasm, but the upper delay was suspicious of organic obstruction."

Fairly acute epigastric pain followed the barium enema, and this persisted for several days.

August 18th.—Barium was still present in the ascending colon. Weight was 10 st. 6 lb.

August 23rd.—A sigmoidoscopy performed by Mr. E. T. C. Milligan showed no abnormality except hæmorrhoids. Occult blood was present in the fæces.

August 26th.—An opaque meal was given by Dr. Martin Berry. Some barium passed through the pylorus and duodenum, but the stomach emptied very rapidly and there was a suspicion of a fistula existing between the stomach and jejunum, as well as between the colon and jejunum as revealed by the barium enema. At one hour the stomach was empty, with traces of meal in duodenum, while the jejunum was loaded. At two hours food was present in the ascending and transverse colon, the latter being very dilated. At four hours most of the meal was present in the ascending and transverse colon. At 24 hours traces of barium were noted in the whole length of the colon. A diagnosis of gastro-jejuno-colic fistula was made. On direct questioning both the patient and his wife now stated for the first time that they had noted belching of fæcal-smelling gas.

August 30th.—Blood transfusion was decided upon. The patient had been found to belong to Group IV.; in addition both the serum and corpuscles of the donor and recipient were cross-tested. No incompatibility was evident. Near the completion of the injection urticarial wheals developed, and the patient complained of headache. Later a scarlatiniform rash appeared and abdominal pain developed. By 2.30 P.M. drowsiness was marked, and paresis of the left side of the face developed. The voice was rather thick, and the patient could not see properly. At 6.30 P.M. the left hand was paresed. On examination it was found that the left side of the face and tongue, left arm, and left leg were partially paralysed. The eyes were abducted to the left, and the tongue was protruding in the same direction. The knee-jerks were hyperactive, and a Babinski plantar response was obtained. The patient was very restless. The blood pressure 120/80.

Sept. 1st.—Patient was seen by Dr. W. J. Adie, who reported left hemiparesis with complete palsy of the arm. It was less marked in the face, and least marked in the leg. There was also left hemianæsthesia involving all forms of sensation, and left hemianopia. The condition was diagnosed as a capsular lesion on the right side of the brain, probably embolic in origin.

Sept. 5th.—A series of charcoal biscuit tests showed that charcoal appeared in the fæces in from six to seven and a half hours. The fæces again contained blood-clot, mucus, and undigested food.

Sept. 10th.—A indefinite mass 2 to 3 in. in diameter was palpable for the first time in the left hypogastrium. The patient's weight equalled 9 st. 7 lb., and as he was steadily going downhill it was decided to operate despite the recent hemiplegia.

OPERATION.

As Mr. E. T. C. Milligan had investigated this case from the surgical aspect during Mr. Kilner's absence on holiday, he was requested to perform the operation at which one of us (T. P. K.) assisted. On Sept. 13th the abdomen was opened by a left paramedian incision, a transverse incision passing outwards to the left being added later in order to give free access to the affected bowel. A large mass was discovered in which the stomach, transverse colon, and jejunum were widely involved. It being impossible to determine definitely whether this was neoplastic or only inflammatory in nature, it was decided to separate carefully the parts and deal with each as its condition dictated. The stomach, transverse colon, and jejunum communicated freely. The opening in the stomach was closed, and the continuity of the jejunum was re-established by end-to-end anastomosis. The partly divided portion of the transverse colon was brought to the surface over a glass rod, the two limbs being approximated by sutures just inside the abdominal cavity. A drainage-tube was passed to the left side, and the abdominal wall was closed in layers. The mass removed was preserved for histological examination.

Microscopical sections showed uniform involvement of the wall of the stomach and jejunum, with actively growing columnar-celled carcinoma which deeply infiltrated the muscular and other layers.

Commentary.

The similarity of the clinical picture of gastro-colic fistula to sprue was commented on by Fairley (1930), and later by Damaso de Rivas (1930). In the latter case sprue had been diagnosed by several specialists. A gastro-enterostomy for suspected ulcer had been performed three years previously, but at autopsy it was found that the surgeon had performed a gastro-colostomy, joining the fundus of the stomach to the transverse colon.

Defective absorption of essential foodstuffs following short-circuiting of the small intestine is obviously the basis of certain clinical features in gastro-jejuno-colic fistula, and incidentally it probably accounts for the close clinical and biochemical similarity to sprue which is essentially a disease of the gastro-intestine characterised by defective absorption of fat, calcium, and possibly also of glucose.* In addition, in sprue there is deficient production in the

* Thaysen (1929) holds that in idiopathic steatorrhœa the characteristic low blood-sugar curves result from some disturbance in the internal regulation of blood-sugar, and not from its defective absorption or destruction in the intestine.

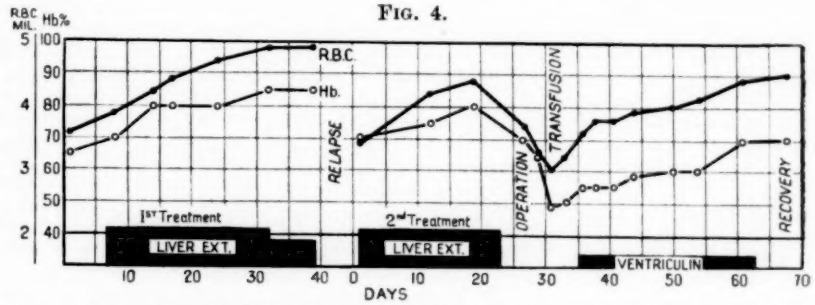
stomach of HCl as well as of that stimulating factor which Castle (1929) has shown to be necessary for the normal erythroblastic activity of the bone-marrow; in its absence megaloblastic hypertrophy ensues with the production of megalocytic anæmia.

Diarrhœa following a gastro-enterostomy should always suggests a gastro-jejuno-colic fistula, and other evidence in Case 1, including the fractional test-meal findings, pointed to the presence of a jejunal ulcer. The radiological report, however, did not support this diagnosis. In view of the subsequent operative findings it is now evident that the barium meal was emptying rapidly from the stomach into the transverse colon, and not into a dilated portion of a sprue small intestine as was reported at the time. The onset of fæculent vomiting finally clinched the diagnosis.

Case 2 was more difficult as the fatty diarrhœa, dyspepsia, loss of weight, and megalocytic anæmia are all characteristic of tropical sprue. The appearance of blood in the fæces suggested intestinal ulceration, while the radiographic findings following a barium meal and enema finalised the diagnosis.

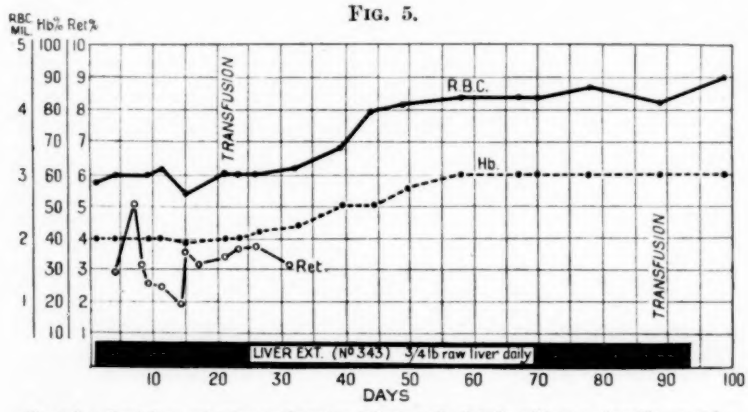
Outstanding features in both cases were the high acid curves as revealed by fractional test-meals, and the lack of a satisfactory therapeutic response to high-protein, low-fat, low-carbohydrate dietary, such as invariably ensues in uncomplicated sprue. Finally, a history of pathognomonic fæcal belching was elicited in both cases, but only following a leading question, and not until the diagnosis had been made on other grounds.

FIG. 4.



CASE 1.—Jejunal ulcer and gastro-jejuno-colic fistula with megalocytic anæmia. Chart showing response to treatment. R.B.C. = red cells in millions. Hb. = hæmoglobin.

FIG. 5.



CASE 2.—Gastric carcinoma and gastro-jejuno-colic fistula with megalocytic anæmia. Ret. = reticulocytes per cent.

BIOCHEMICAL FINDINGS.

Our recent work at the Tropical Diseases Hospital has shown that there is a definite biochemical background to sprue. Typically it is characterised by a decreased or absent acidity in the gastric juice, while the fæces show a high total fat with adequate splitting. Blood analysis reveals a low blood calcium, a normal or low value for inorganic phosphorus, and a low cholesterol content. Serum bilirubin may be increased, but rarely markedly so, and, following the glucose-tolerance test, minimal rises in blood-sugar occur.

In the two cases of gastro-jejuno-colic fistula under review the total fæcal fat was definitely excessive, equalling 33·9 and 46·25 per cent., while splitting was adequate; low blood calcium values of 8·0 and 8·4 mg. per cent. were recorded, while the inorganic phosphorus equalled 2·7 and 3·7 mg. per cent. respectively. In these respects the biochemical findings resemble those met with in sprue, and are probably dependent on defective absorption. The blood cholesterol was estimated in one patient only (Case 2), and here two analyses at three weeks' interval also showed low values—79 and 83 mg. per cent.

Other biochemical differences were however noted. Thus the fractional test-meal showed high acid curves, Case 1 being one of the highest grade hyperacidities we have encountered. Its rapid restoration to normal limits following operation was remarkable (Fig. 2). The presence of a high acid curve in Case 2 suffering from carcinoma was also instructive (Fig. 3).

A glucose-tolerance test in Case 1 showed a normal blood-sugar curve. This is of interest, demonstrating as it does that glucose was being normally absorbed and metabolised; in our recent series of 18 cases of tropical sprue, 11 showed maximum rises in the blood-sugar of less than 30 mg. per cent., following the administration of 50 g. of glucose by the mouth.

In their therapeutic response these cases also differed biochemically from sprue, for while it was possible by the administration of calcium per os and a high-protein, low-fat, low-carbohydrate diet to establish normal values for blood calcium, no permanent decrease in fæcal fat followed treatment.

HÆMATOLOGICAL FINDINGS.

Evidence is gradually accumulating that certain lesions of the stomach and small bowel may be casually related to megalocytic anæmia. Thus occasional cases have been cited by Castle (1929) in extensive cancer of the stomach, and even following complete gastrectomy. Hurst (1930) has reported an example following gastro-enterostomy, and Little, Zerfas, and Trusler (1929) detail a most interesting case of

small bowel abnormality where, owing to multiple anastomoses following appendicitis and intestinal obstruction with fæcal fistulæ, almost all the absorptive function of the small bowel was lost. Finally Castle (1930) found that the gastric juice of a case of megalocytic anæmia with multiple anastomoses of the small intestine contained normal amounts of hydrochloric acid, pepsin, and rennin, but was entirely deficient in the stimulating factor necessary for normal erythroblastic activity of the bone-marrow; furthermore, the anæmia responded in typical fashion to liver extract.

The blood picture in these two cases and their response to treatment are of considerable importance and may be studied in the accompanying charts (Figs. 4 and 5). In Case 2 the blood examined showed that the anæmia was megalocytic in type, the average diameter of the red cell by halometer measurements† equalling 8·4 microns. The colour-index was, however, low (i.e., 0·7), whereas in Burma, two months previously, it had been 1·2; this reduction is attributable to treatment with liver extract which generally leads to a disproportionate increase of corpuscles over hæmoglobin. The patient was put on a high protein diet and liver extract (Eli Lilly, No. 343; dosage = ¾ lb. liver daily), and under this régime there was a rise in reticulocytes to 5·1 per cent. on the seventh day. Though the reticulocyte count was maintained somewhat above the normal level (0·1–1·0 per cent.) for a considerable period, there was no corresponding improvement in the blood counts over the first five weeks of treatment, the probable reason for this being the presence of septic absorption from the ulcerated surfaces of the gastro-jejuno-colic fistula. Throughout this period there was a leucocytosis of from 15,000 to 20,000 cells per c.mm., and a neutrophilia varying between 77 and 82 per cent. Even the blood transfusion on June 24th did not appear to exert any immediate beneficial effects. About this time a drop in the leucocyte count occurred, and from July 11th onwards counts varying from 9000 to 13,000 per c.mm., with a neutrophilia of 66 to 75 per cent., were observed. Simultaneously with the decrease in the white count there occurred a definite improvement in the red cell count, the corpuscles rising from 3,100,000 to 4,500,000, and hæmoglobin from 44 to 60 per cent. over a period of approximately two months (Fig. 5). This improvement in the anæmia was also reflected in halometer measurements of the diameter of the corpuscles which remained stationary at 8·4 μ over the first five weeks, but thereafter fell progressively until they reached a measurement of 7·8 μ.

The hæmatological findings in Case 1 were similarly instructive. On the first admission there was a moderate degree of anæmia—i.e., red cells, 3,600,000; hæmoglobin, 65 per cent.; colour-index, 0·9. After a course of high protein dietary and liver extract (= 1½ lb. daily) he was discharged with a red cell count of 4,900,000 per c.mm.; hæmoglobin, 85 per cent.; and colour-index, 0·9. Later relapse occurred, and on readmission the red cells were 3,400,000, hæmoglobin 70 per cent., and the colour-index 1·0. The diameter of the corpuscle was at this time larger than normal—i.e., 7·8 μ. Again a high protein diet and liver extract were prescribed, but unfortunately the reticulocyte response was not investigated. Improvement ensued for the first three weeks; this was followed by a fall in both red cell count and hæmoglobin value. Operation was performed on the twenty-sixth day, and an increase in the anæmia followed: transfusion of 520 c.cm. of citrated blood was given on the thirtieth day, and liver extract therapy was reinstituted. This, however, nauseated the patient, and five days later he was put on full doses of ventriculin (Parke, Davis and Co., 20 g.) which he tolerated well. A progressive increase in the hæmoglobin and corpuscles followed, and on discharge from hospital the red cells were 4,500,000 per c.mm., the hæmoglobin 70 per cent., and the colour-index 0·8 (Fig. 4). Later normal values were established. While in this case the restoration of the anæmia following operation cannot be with any certainty attributed to transfusion and ventriculin, the original improvement following liver extract may reasonably be ascribed to its administration. Though less conclusive, the balance of evidence favours the view that we were again dealing with an anæmia of megalocytic type.

The findings in these two cases point to the advisability of further biochemical and hæmatological investigations in animals in which gastro-colic and gastro-jejuno-colic fistulæ have been artificially induced.

Since submitting these two reports for publication a third case of gastro-jejuno-colic fistula has been admitted to the Hospital for Tropical Diseases under Dr. Carmichael Low. It presented many similar features.

A Third Case.

The patient, aged 58 years, was a chef in the Cunard Steamship Company, and had visited both South America and Ceylon. On Oct. 7th, 1931, he was transferred from the Albert Dock to the Tropical Diseases Hospital, his main complaint being "diarrhœa and weak legs" for the past year.

He had enjoyed good health until nine years ago, when gastric symptoms developed. A posterior gastro-enterostomy had been performed at the Seamen's Hospital, Greenwich, on Dec. 14th, 1927. Subsequently he had remained well until a year ago, when the present illness started with vomiting, diarrhœa, and cramp in the legs after eating mushrooms. Loose, offensive, clay-coloured stools followed. As many as eight were passed daily, being distributed evenly over the 24 hours. Though the appetite remained good numbness and weakness developed in the legs, which later became œdematous. Much weight was lost.

EXAMINATION.

The patient was edentulous, having recently had total extractions. The *tongue* was large, red, slightly furred and showed some fissuring. No atrophy of the fungiform or filiform papillæ was evident; lingual and buccal apthous ulcers were absent.

There was some definite tenderness on deep palpation of the *abdomen* just above and to the right of the umbilicus, while central periumbilical distension extending inferiorly was very evident. Visible peristalsis of the gut was seen through the atonic wasted parietes. A right inguinal hernia was present.

The patient, who was quite unable to stand, presented marked wasting of the legs, the skin of which was harsh and dry; a flaccid paresis of all the muscle groups was present. Appreciation of both light-touch and pin-prick was very variable to the level of the umbilicus, but the patient was a bad witness and difficult to examine. Deep sensation appeared to be increased. The tendon reflexes were absent, and the superficial abdominal reflexes were elicited on the left side only. The plantar reflexes were not obtained. For some days before death there was loss of control of the anal sphincter.

SPECIAL INVESTIGATIONS.

Dr. Martin Berry was not able to make a satisfactory examination with the barium meal owing to the advanced illness of the patient; an opaque enema failed to pass the splenic flexure.

† Where the red cells exceed 2,000,000 per c.mm., halometer measurements give very constant values; most of the megalocytic anæmias of the tropics fall into this category. In the severer grades of pernicious anæmia with counts of 500,000 to 1,500,000 per c.mm., the physical properties of the blood may make the preparation of films giving reliable and defined haloes very difficult, and under these circumstances the more informative Price-Jones curves become indispensable.

Blood.—Red cells 3,600,000 per c.mm., hæmoglobin 68 per cent. (Haldane), colour-index 0·94, diameter of corpuscle 8·4 μ. The leucocytes numbered 6000 per c.mm., and the differential count was: neutrophiles, 77 per cent.; lymphocytes, 20 per cent.; monocytes, 3 per cent.; eosinophils, 0 per cent. There were numerous megalocytes as well as anisocytosis, poikilocytosis, and polychromasia, while the average diameter of the corpuscle estimated by the diffraction micrometer (Eve's halometer) varied between 8·4 and 8·6 μ. The anæmia which was only of mild degree must, therefore, be regarded as definitely megalocytic in type.

Biochemical observations.—The urine showed no abnormality, its diastatic power equalling 10 units, and for the 24-hour secretion 2600 units. The brom-sulphalein test for liver function showed a 70 per cent. dye retention after five minutes, and a 10 per cent. retention after half an hour. By the latter time all dye should have disappeared. The van den Bergh reaction gave a negative direct and a positive indirect reaction of 0·5 units. The stool contained occult blood and chemical analysis showed fatty acids, 25·0 per cent.; neutral fat, 6·8 per cent.; total fat, 31·8 per cent., of which 78·8 per cent. was split and 21·2 per cent. unsplit. Splitting was adequate, though there was an excessive total fat content. Fæcal pigment was almost entirely absent, only a trace of stercobilin being present.

The patient was originally suspected by his doctor of suffering from gastric carcinoma with secondary deposits in the vertebræ, and later this was modified to a diagnosis of chronic pancreatitis or carcinoma of the body of the pancreas. On admission to the Tropical Diseases Hospital the neurological features plus the megalocytic anæmia suggested the possibility of subacute combined degeneration, while the fatty clay-coloured stools associated with marked emaciation raised the question of tropical sprue. Throughout, the temperature was normal, and neither fæcal vomiting nor the eructation of foul gas was reported. Finally a diagnosis of gastro-jejuno-colic fistula was made. The patient was much too ill for operation. Hepatex P.A.F. was commenced intramuscularly, and a 3 per cent. reticulocyte response was noted on the second day, but on the third day the patient died. At autopsy the diagnosis was confirmed.

AUTOPSY.

Nov. 1st.—As numerous adhesions were present the stomach, duodenum, the proximal and distal anastomotic loops of the jejenum, as well as the transverse colon were tied off and removed en masse from the abdomen. On opening up the stomach the stoma of the gastro-enterostomy was found patent, and the finger could be inserted from it into the loops of the jejunostomy, while anteriorly it passed on into the transverse colon. Incision of the duodenum showed a deep crater ulcer about 1 cm. in diameter situated on the posterior wall 1·5 cm. from the pylorus; its base was adherent to the pancreas and covered with epithelium. Marked narrowing of the duodenal lumen occurred in its vicinity owing to cicatricial contraction. On incising the transverse colon a large circular opening about 4 cm. in diameter was found communicating directly with the distal loop of the jejunostomy, very close to its junction with the stomach. The liver was yellow and fatty on section, weighing 1240 g.; it failed to give the Prussian blue reaction for iron. The spleen was atrophic and a quarter its usual size (42 g.), while the kidneys were somewhat tough in texture. The left suprarenal was greatly hypertrophied and weighed 24 g.; the right was also enlarged (12 g.). No abnormality of the pancreas was detected. The heart was small and weighed 230 g.; the coronary arteries were atheromatous and calcified. A terminal broncho-pneumonia involved the lungs.

Bone-marrow.—The macroscopical appearances of the marrow in the sternum, ribs, vertebræ, and femur were not typical of pernicious anæmia. The medullary canal of the right femur contained much yellow marrow interspersed with small foci of red marrow, which was also noticeable in the interstices of the bony trabeculæ in the head of this bone. Microscopical sections of marrow expressed from the ribs showed numerous nucleated red cells of the erythroblastic series in different stages of activity, as well as many granular myelocytes; megaloblasts also were present. The marrow was regarded as one of mixed type, in which megaloblastic hyperplasia was far from complete.

Spinal cord.—The spinal cord was removed and sent to Dr. J. G. Greenfield, who kindly sectioned the specimen and reported the absence of subacute combined degeneration.

The case was of considerable interest as it constitutes the third of the series presenting a megalocytic anæmia with sprue-like diarrhœa; the neurological features evidently originated from peripheral nerve involvement, and not from any cord lesion. Evidences of hæmolysis were not present; thus there was no hyperbilirubinæmia during life, and the liver failed to give the Prussian blue reaction at autopsy. The bone-marrow showed only a mild degree of megaloblastic hyperplasia. From the clinical viewpoint the case again illustrates the fact that any intractable diarrhœa supervening after gastro-jejunostomy should be regarded as originating from a gastro-jejuno-colic fistula until such a diagnosis is disproved.

Conclusions.

1. Three cases of gastro-jejuno-colic fistulæ presenting a clinical picture simulating sprue are recorded. 2. All presented an anæmia of megalocytic type. 3. Two were associated with high HCl secretion, and both responded temporarily to liver extract in adequate dosage. 4. Analysis of the fæces showed a high fæcal fat with adequate splitting. 5. Blood chemistry revealed a lowered total calcium associated with a normal inorganic phosphorus and a low serum bilirubin content. 6. The rôle played by malabsorption in a short-circuited small intestine, and the absence of Castle's stimulating factor in the production of the anæmia, are discussed.

We wish to thank Dr. Carmichael Low and P. H. Manson-Bahr for affording us facilities for the investigation and publication of two of the cases recorded in this paper; and also to acknowledge our indebtedness to the Colonial Medical Research Committee, whose research grant made available the services of Mr. R. J. Bromfield.

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THE MANCHESTER AND SALFORD HOSPITALS.—The Manchester and Salford Medical Charities Fund, which consists of the Hospital Sunday Fund and allied societies, reports that the number of cases treated in the hospitals of the two cities in the last financial year was 313,632, against 300,500 in the previous year. The expenditure was £424,467, and there was a deficit of £45,232. The districts outside sent over 50,000 cases at an expenditure of £135,420, towards which they contributed £85,133. There are 5000 cases in Manchester and Salford waiting for beds in the hospitals.

OVERCROWDING AT VICTORIA INFIRMARY, NEWCASTLE. The accommodation at this hospital, including the Innes Hopkins memorial home, is 576 beds, but the number occupied is usually 604, and on one day 656 were occupied, and there is a waiting-list of 2000. The house committee state that "from time to time serious results have been traced in part to the crowding together of patients, and in part to the fact that the normal proper attention can, only with the greatest difficulty, be given in the conditions which have obtained in the past." It has therefore been decided not to exceed the regulation number of beds, and it is announced that in future, except in the case of sudden emergencies, the casual and out-patients' departments will be confined purely to consultative work and to services of a special nature which are not available elsewhere. Cases which can be dealt with in the ordinary course by a general medical practitioner will not be treated.

PROTEIN IN ASTHMA.

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FOR many years it has been known that certain subjects of allergic diseases gain great benefit from treatment with tuberculin. A number of cases of phthisis associated with asthma were treated in this manner, and it was noticed that the asthma was very favourably influenced. These reports led to careful investigation by van Leeuwen,[1] who was led to use tuberculin in asthma as a routine measure for a number of reasons.

Assuming that asthma is an allergic disease, in which the subject is hypersensitive to certain substances, it clearly becomes necessary to discover these. Attempts to discover the causative agent were made by skin tests, but these proved unsatisfactory. Van Leeuwen says that "the causative agent of allergic attacks is seldom revealed by skin reactions," though the allergic state may be revealed. This is in complete accord with our results. Even when skin tests reveal definite hypersensitiveness, attempts to produce specific desensitisation frequently fail, though subsequent treatment with tuberculin may produce good results. Van Leeuwen found that "hypersensitiveness to a certain causative agent may be reduced also by the injection of small quantities of another allergen, provided the patient is hypersensitive to the latter allergen too." With this we also agree.

For these reasons it was clear that non-specific desensitisation was worth a trial, and in 1925 van Leeuwen published the results of such treatment of 300 cases of asthma. He found that most sufferers from allergic diseases are hypersensitive to tuberculin, and therefore chose this substance for the experiment. About 50 per cent. were "completely or almost completely cured, while about 25 or 30 per cent. were distinctly or considerably improved, and 15 to 20 per cent. remained absolutely uninfluenced." He believes that the failures are those who are very sensitive to climatic influences.

These results of Dr. Storm van Leeuwen's were so much more consistent than usual, and experience has shown that this investigator's work is always so reliable, that it seemed worth while to ascertain for ourselves what kind of results we could obtain with the same technique. After a year's work there was no doubt whatever that the system of injecting old tuberculin in high dilution had a very marked effect upon asthmatics of all kinds.[2] It then occurred to one of us that there must be some definite reason for this effect. It seemed likely enough that the tuberculous elements contained in old tuberculin had very little to do with the action of the preparation on asthmatics. It seemed much more probable that it was the protein in high dilution which was the really effective agent. We therefore decided to study the action of a simple solution of the protein—simple broth, such as might be used for the cultivation of micro-organisms. The substance selected was the "Tabloid Broth" made by Messrs. Burroughs, Wellcome and Co. and sold by them for the purposes of making artificial media. A standard broth solution is made according to their directions by dissolving one of their tabloids in 5 c.cm. of water and sterilising by boiling.

This was taken as the standard solution and some very high dilutions were made from it. Experience shows that in practice the dilution would range from one in a hundred thousand to one in a hundred million, giving one in a million as a good average dilution for starting work. These solutions of very dilute protein are renewed every month or two, because there is a very strong theoretical reason why they may degenerate in high dilution. It has been our practice to start with a dose of 0·1 c.cm. of one in a million or one in ten million. It may be mentioned here that these dilutions are usually referred to by their number—that is to say, one in a million is six dilutions in tens of the standard substance and is alluded to as D6, and in the same way, one in ten million would be alluded to as D7.

RESULTS WITH SOME SEVERE CASES.

Nearly all cases (with one or two exceptions) taken on for treatment by this method have been definitely selected. They were selected because they were extremely ill or suffered very severely from asthma and no other treatment had any effect—or any but a very slight effect upon them. Some of them, indeed, were under observation for a year or more before this treatment was started. From the "Remarks" column in Table I. it will be seen that many of them had some minor surgical operation in the nose or throat before this broth was tried upon them; and in such cases a definite time was allowed after the operation in order to eliminate any possible improvement which might occur as a result of surgery. The cases are not the whole number, but are those who have been under treatment for some time and from whom replies were obtainable as to the results of the treatment from their own point of view. They are quite unselected in any way except for severity of disease and reasonable regularity of attendance.

Nearly all of them have had their skin reactions done and a very large number of proteins were used in the process. It seems reasonable to divide the substances used into food (or internal protein) and external proteins; and the external proteins have again been divided into pollens, hairs (under which term is included feathers and all materials such as may be obtainable in epidermal dust), and micro-organisms.

The information gained by skin testing is, on the whole, of very little practical value; it is so common to find that a patient is sensitive to many different proteins and very often in different groups. One would say that the group which most often stands alone is the pollen group. It is very rare to find a person who is sensitive to only one type of protein. Moreover, we do not think that the type of protein to which a patient is sensitive is much guide to prognosis or to the effect of treatment or, indeed, of help in any way except, perhaps, in making certain of an allergic state. Even this is not certain, because there is one case in this series on whom extensive trials were made; although she was frequently seen in very bad attacks of asthma, it was quite impossible to find any protein to which her skin was definitely sensitive.

If we had to place the four classes in order of difficulty of treatment, we would say that the bacterial type was most resistant, followed by food, hair, and pollen in that order, the pollens being the ones that react the most easily. But this is not

[1] Allergic Diseases. Philadelphia and London, 1925.
[2] Practitioner, 1927, cxviii., 382.

really a scientific statement, because the results are too confusing to give any certain guidance.

There is no doubt whatever in our minds that small weekly doses of broth in high dilution given to an asthmatic person have an extremely marked effect on the course of the attacks, even when these attacks are very bad and recurring nightly and have resisted all other attempts to modify them. Where the patient is relatively slightly affected, especially in children, the result for the most part is dramatic and immediate. But it is equally clear that if the weekly dose of protein is discontinued within anything less than six months to a year, or even longer, the attacks will recur, and are sometimes almost as bad as they were before any injections were given. It has been found extremely difficult to increase the dose once the right dose is found, or to increase the intervals—particularly in bad cases. In slighter cases the dose may be very, very slowly increased and the interval very slowly lengthened. But the chief point and the main difficulty is to find the right dose for the individual, because this dose may vary between 0·1 c.cm. of D.8 (1 in 100,000,000) to 0·75 c.cm. of D.6 (1 in 1,000,000).

A SYSTEM OF SHORT-TIME PROPHYLAXIS.

We cannot, therefore, advance this system as exactly one of treatment in the ordinary sense of the word. It is, rather, a system of short-time prophylaxis. An effort to make this prophylaxis lasting and attainable in a reasonable period has not been very successful. At the same time, such is the importance to the unfortunate people (who, in the most literal sense of the word, "suffer" with this complaint) of the relief given by this system that they will attend with the utmost regularity, week by week, in order to avoid any return to their previous state. It is no exaggeration to say that many of these persons, who previously spent many months in the year completely in bed and utterly incapacitated, have been able to carry on with their ordinary duties and to live a reasonably normal life. It is true that some of them may still wake up once in a night with a certain amount of tightness of the chest, hardly amounting to an attack; and others, though they may never have anything resembling an attack, still have a good deal of bronchitis, which we find is the most persistent sequel after the asthmatic spasm itself has been abolished.

Nevertheless, we would not have it regarded as a special form of treatment, but rather as an interesting experimental fact, that a small amount of foreign protein introduced under the skin periodically will, over a certain short space of time, maintain a person in a state of reduced susceptibility to his allergic spasm.

The cases here collected are set forth in Table I.

Cols. 1, 2, and 3 are self-explanatory. In No. 3 it will be noticed that some cases appear to have had the disease for as many years as they are old. This, of course, is probably slightly misleading; it means either that the patient says that he has had the condition for as long as he can remember, or the mother has informed us that the child has had the condition "ever since it was born."

Col. 4 gives the sensibility to various proteins. They have been grouped under the headings of: (F) which is food of all kinds; (E) external protein—i.e., all hair combing and dust products generally; (M) micro-organisms; and (P) pollen.

Col. 5, the period under treatment, is again difficult to get quite perfect because four cases were occasionally irregular in attendance, and this is indicated by the abbreviation "irreg." The great majority of cases, however, come extremely regularly, because as long as they do so they are, for the most part, very much better. The irregular cases are often those who improved so rapidly that they took the risk of not attending, sometimes because it was difficult to get away from their work, to which they had been able to return.

Col. 6. Results have not been put down as "cured" or words of that kind because, in the present circumstances, such words are misleading and have a Continental tang. We have placed the four groups as follows: (A) signifies cured, in the special sense of the word that they have no attack as long as they are under treatment; (B) signifies very much improved—i.e., although they occasionally have a transient tightness of chest and possibly still a little bronchitis, their asthma is, to all intents and purposes, negligible; (C) groups those cases which may be called improved—i.e., they still have a certain amount of asthma and even, occasionally, a definite attack; but they are different in health since they have been under the influence of the injections.

TABLE I.—*Summary of Cases Treated.*

Case.	Age.	Duration of disease. Years.	Sensibility.	Months under treatment.	Result.	Remarks.
1	*2*	*3*	*4*	*5*	*6*	*7*
1	11	11	F.	5	A.	—
2	36	15	—	14	B.	—
3	32	9	E.P.B.	8	C.	Some fibrosis of left lung as well.
4	27	25	F.E.	17	B.	Excessive bronchitis.
5	35	10	F.E.B.	5	B.	Septum operation for chronic rhinitis.
6	13½	1	F.P.	4	B.	Tonsillectomy.
7	41	10	E.	10	C.	Excessive bronchitis.
8	35	7	E.P.	16	B.	,, ,,
9	38	8	F.E.P.	6	C.	,, ,,
10	39	2	Nil ex 45	24	A.	Nasal polyp. removed.
11	21	6/12	F.E.	8 irreg.	A.	In spite of irregular attendance — always free when attending.
12	25	3	Nil ex 48	24	A.	Excessive bronchitis.
13	22	2	P.	24	A.	—
14	37	Several	F.E.	7 irreg.	A.	Gas poisoning in war.
15	20	2	F.E.	8	C.	Septum operation.
16	42	7	F.	7	C.	Very unsatisfactory attendance.
17	42	4/12	F.E.	24	A.	Severe attacks of bronchitis.
18	7½	3	—	6	A.	Not a severe asthma—cured at once.
19	18	8	E.B.	24	B.	Old pulmonary tuberculosis healed.
20	42	15	—	6	A.	Excessive bronchitis.
21	11	8	F.E.B.	24	B.	—
22	31	9	—	30	C.	Nasal polyp. removed with turbinectomy.
23	30	6	E.B.	8	B.	Twice relapsed after leaving off injections.
24	49	5	F.E.	12 irreg.	C.	Fibrosis of lung with excessive emphysema.
25	6	4	F.E.B.	18	A.	—
26	9	9	F.E.	24	A.	—
27	30	1	B.	9	B.	—
28	41	10	D.	24	B.	—
29	44	Many	E.P.	18	B.	High blood pressure.
30	50	4	?	6	A.	—
31	9	6	?	6	A.	"Angioneurotic œdema."
32	7	1	F.	24	C.	Middle turbinals cauterised.
33	39	18	E.P.	36	B.	Often seen in very bad attacks at hospital.
34	24	2	?	12	A.	—
35	43	1½	F.E.	48	A.	Nasal polyp. removed.
36	20	2	F.E.P.	36	B.	—
37	29	14	E.B.	24 irreg.	C.	Fibrosis of right lung. Only attended when attacks returned.

We have not included a class where there is no improvement or no change after the treatment has continued for some weeks because we cannot find a single case to put in it. We do know of cases who might be included under this heading, but they have never attended in the least regularly, or, indeed, ever made any attempt to attend regularly; and they have only come up when actually having bad asthma. Of course this type of case would only be treated for a few weeks with the broth. Burroughs Wellcome (B.B.W.) and, therefore, is not strictly included in this series.

This series is too small for statistical treatment and, as a group of asthmatics, it is not really comparable with the average run of asthmatics or with any published series of asthmatics, because the cases are, as previously pointed out, selected for their badness, with the exception of one or two; therefore the results are unsuitable for comparing with those of any other process. Nor is there any attempt to put them into a therapeutic category. But, as shown in Table II., we find that 40 per cent. are

TABLE II.—*Summary of Results.*

Class.	Number of cases.	Percentage.
A.	15	40·5
B.	13	35·1
C.	9	24·4
Total ..	37	100

very markedly affected by this injection to the extent of almost complete inhibition of the spasm; 35 per cent. are markedly improved by it, with considerable modification of the spasm; 24 per cent., rather under a quarter, are affected but not very deeply, and this applies to very bad cases.

This paper is merely to call attention to the undeniable fact that a small injection of protein in high dilution has very marked effect on the spasmodic attack associated with asthma. It is not easy to give an explanation of these facts which shall be completely satisfying because our knowledge of what happens to a few molecules of foreign protein introduced hypodermically is far from perfect. It would be easy enough to put forward hypotheses on general chemical grounds or on our general knowledge of blood chemistry, but in the absence of any experiments in this direction such a procedure would be unprofitable until we have been able to make further tests, and these must necessarily take some time.

In most of the published accounts of specific injections with a preparation of the specific protein or proteins to which the skin is sensitive, the writers are very vague on the method of preparation and standardisation of the dose of their product. We think that the experiments recorded in this paper explain the conflicting reports on the value of these "specific" injections in asthma. For the specific product may, if it happens more or less by chance to be in the *correct dose*, deal with the asthma as a whole as effectively as the product that we have tried. But our own tentative experiments (undertaken some years ago) in specific therapy were *not* successful.

SUMMARY.

(1) A small weekly hypodermic dose of simple animal protein in high dilution is an effective agent in preventing allergic spasm.

(2) It is difficult to prolong the action of the protein except in mild cases.

(3) We agree with van Leeuwen that, while skin tests often reveal the allergic condition, they are not of therapeutic value.

DOSAGE AND RESULTS OF SANOCRYSIN TREATMENT.

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THE results of sanocrysin treatment depend upon many factors, above all upon the extent of the tuberculous process, and upon the dosage. The treatment can be used either as a radical cure or to give temporary relief, and its results should be judged accordingly and with reference to the late as well as to the immediate results. I still regard the clinical reactions elicited by the treatment as a result of the setting free of toxins. The degree of reaction is in direct proportion to the extent of the tuberculous change and to the dosage of sanocrysin; the clinical features depend upon the pathological anatomy, and primarily upon whether the tuberculous lesion is closed or open—whether the toxic substances are absorbed or evacuated by expectoration. The treatment of open lesions is accompanied by a brief reaction, but that of closed lesions may be associated with very severe reactions due to toxic absorption. An advanced stage is therefore a contra-indication to sanocrysin, as the patient will be unable to stand the intoxication produced by the treatment. I now reserve sanocrysin for cases where cure, or at any rate considerable improvement, can be anticipated. The limits for effective sanocrysin treatment can only be learnt by experience.

IMPORTANCE OF HIGH DOSAGE.

Many of the poor results of sanocrysin reported by physicians in various countries appear to me to be due to faulty—usually too low—dosage. All animal experiments have shown the desirability of giving a dose of from 1·5 to 2·0 cg. per kg. of body-weight. From the beginning I have planned my dosage to conform to the nature and extent of the lesion and to the weight of the patient. In most instances the first dose has been 1 cg. per kg., repeated and increased according to the condition of the patient and the degree of reaction. Usually the first two or three doses have been given at two-day intervals, and the others at intervals of four, five, or six days. Thus my usual first dose is 50 cg., and the second dose 75 cg. or 1·0 g.; as much as 1·25 or 1·5 g. is given if the weight of the patient warrants it. Patients with acute pneumonic processes have only 25 or 35 cg. at the first injection, as they are likely to have severe intoxication. If practicable, the treatment is continued until there is no reaction after doses of 1·5 or 2 cg. per kg., and is then followed by sanatorium régime. The course of the disease is considerably curtailed by sanocrysin, and the reactions are not dangerous if they are properly managed. I am convinced that better results are obtained by giving large doses which cause reactions than small doses which do not cause reactions.

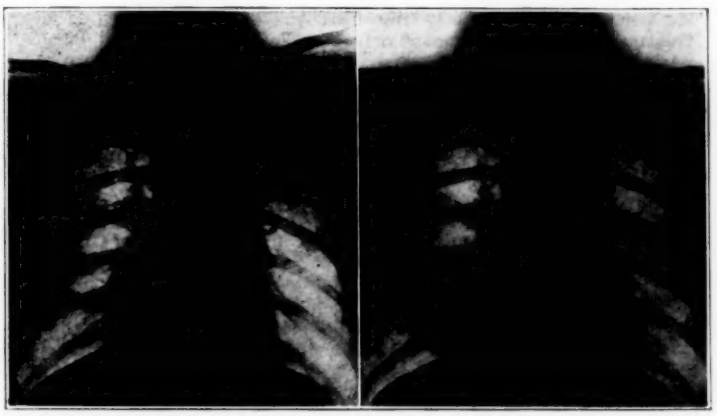
Some workers have combined sanocrysin with serotherapy, but have abandoned this method; I am, perhaps, the last to have abandoned it, but I have now done so, chiefly on account of the criticism put forward by Bie. It certainly seemed to me at one time that the serum might save life when very severe cases developed so-called "shock" after sanocrysin.

Permin first suggested an initial dose of 5 or 10 cg., the quantity being slowly increased up to 1 g. This

method, largely used in England, avoids severe reactions but requires a large number of injections, of which the early ones are quite useless therapeutically and only increase the amount of metal stored in the organism (Hansborg). The absence of a reaction is by no means a desideratum; the activation of the tuberculous focus, especially an old focus (Bie and Gravesen), may be of the greatest importance to later healing. Gravesen, indeed, asserts that adequate contact between the focus and the remedial agent can only be achieved by means of hyperæmic lung tissue. Most workers are now trying the larger dosage (E. D. Fischer). In my opinion, however, the total dose should not exceed 6 to 8 g. on account of storage.

FIG. 1.

FIG. 2.



Radiogram showing typical infraclavicular focus.

Condition after treatment.

To illustrate the importance of activation of the lesion in a case of closed tuberculosis without expectoration I cite the following case.

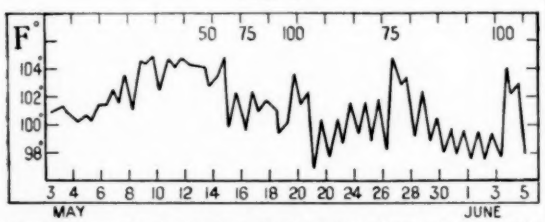
A man, aged 37, was admitted on Dec. 19th, 1929, with a temperature of 39·3° C. The temperature remained high during the period of observation; on Jan. 10th it was 38·4° C.–39·2° C. His weight was 60·7 kg., and he had a typical infraclavicular focus (Fig. 1). Sanocrysin treatment was started on Jan. 11th. The temperature fell after the first injection, and the patient suffered no discomfort. The focus completely disappeared, as shown in Fig. 2, and the weight increased to 63·9 kg.

Date.	Dose of sanocrysin.	Temperature, deg. C.
Jan. 11th	50 cg.	38·5–39·7
„ 14th	75 „	37·6–38·4
„ 17th	100 „	37·4–38·0
„ 22nd	100 „	37·0–37·6
„ 30th	100 „	37·2–37·8

A second example illustrates the value of the treatment in a case of longer standing with bacilli in the sputum.

A woman, aged 20, was admitted on April 16th, 1928. She was found to be suffering from pleurisy, tubercle bacilli were demonstrated in the sputum, and she had a

FIG. 3.



Temperature chart showing effect of injections of sanocrysin (50 cg., 75 cg., &c.).

few small hæmoptyses. On Jan. 15th, 1929, she was transferred to a sanatorium, where she remained for five months, the sputum being positive all the time. She was sent back to hospital on August 10th on account of an intestinal complaint, and was transferred to my department. She then weighed 40·5 kg., and had bacilli in her sputum. Auscultation revealed nothing definite except some fine crepitations below the right clavicle, but the radiogram showed several small infiltrations in the central part of the lungs. Her temperature was 36·8°–37·5° C. Sanocrysin treatment was instituted on August 14th. The bacilli disappeared from the sputum after the fourth injection, which amounted to about 2·5 cg. per kg., and her weight rose to 44·9 kg. The sedimentation test on August 14th was: 1 hour, 23 mm.; 2 hours, 54 mm. On Feb. 2nd, 1930, it was: 1 hour, 6 mm.; 2 hours, 19 mm. Thus this patient, who had been treated in hospital and sanatorium for 16 months, was freed from tubercle bacilli in the sputum in 16 days by sanocrysin treatment.

Date.	Dose of sanocrysin.	Temperature, deg. C.
August 14th	35 cg.	36·6–38·1
„ 17th	50 „	36·8–37·8
„ 21st	75 „	37·0–37·6
„ 26th	100 „	37·0–38·4
Sept. 30th	75 „	37·3–38·4
Oct. 7th	75 „	37·3–38·2

(After the injection on August 26th there was a marked exanthem. Bacilli were found in the sputum for the last time on August 30th. Treatment was postponed on account of a non-specific angina.)

The effect of sanocrysin on tuberculous lymph glands is well illustrated by the following case.

A man, aged 24, had on admission enormous glandular swellings in the neck. The diagnosis was confirmed by microscopic examination of the gland tissue. His temperature was 40·2° C., and his weight 63·7 kg. As his temperature remained high, sanocrysin treatment was instituted, combined with serum. After two months his temperature was normal, and he remained well, his weight increasing to 78·8 kg. (Fig. 3).

Date.	Dose of sanocrysin.	Temperature, deg. C.
May 14th	50 cg. (serum)	40·1–40·0
„ 15th	—	39·8–40·5
„ 17th	75 cg. (serum)	37·7–39·3
„ 20th	100 „ „	38·2–39·9
„ 27th	75 „ „	37·3–40·5
June 4th	75 „ „	36·8–40·2
„ 6th	(Exanthem)	37·2–37·9
„ 12th	—	37·2–37·9
„ 13th	—	37·0–37·5

CONCLUSIONS.

Sanocrysin has now been used and discussed for about seven years, so that it is safe to estimate its value. In previous papers I have reported a large number of cases, and the accompanying table gives my aggregate results.

Type of case.	Well.	Improved.	Unchanged or worse.
Mild sputum-positive ..	10 } 60	—	—
Mild sputum-negative ..	50 }	—	—
Severe sputum-positive ..	23 } 44	56 } 65	—
Severe sputum-negative ..	21 }	9 }	—
Very severe	—	6	64
Pleurisy	86	5	—
Gland tuberculosis ..	18	—	—
Pulmonary tuberculosis in children	13	4	—
Totals	221	80	64

Statistics naturally depend on the selection of material; these figures include all the severe cases treated in the early experimental days. Actually, statistics cannot correctly represent the results of treatment; only the man who has worked with the patients realises how much is gained by using sanocrysin, even in the more severe cases, where the late results are often astonishingly good.

It is most important to institute the treatment as early as possible, as this will check the progress of the lesion in many cases. In the more severe forms of phthisis, sanocrysin can be used to great advantage in combination with such other methods as artificial pneumothorax and resection. Gravesen has reported a number of cases treated in this way.

I use sanocrysin as a routine measure in tuberculous pleurisy; it cuts short the hospital period and does away with the old familiar type of case that needed months and months of treatment. It is really almost a "radical" treatment in the sense that it acts on the focus of the lesion, whether this be in the lungs or in the glands. The late results are very encouraging. I regard it as the best remedy that we have at the present time, and believe that its use will mean recovery for many patients who would otherwise be without hope, and considerable curtailment of the course of the illness for many others.

SANOCRYSIN IN PULMONARY TUBERCULOSIS.*

By E. H. Allon Pask, M.D. Lond.,
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Sanocrysin—a double thiosulphate of gold and sodium—has been tried by me on 36 adult patients suffering from pulmonary tuberculosis selected from 320 cases treated since August, 1929, at the High Carley Sanatorium, Ulverston, Lancashire. The broad indication for the use of the drug has been in patients not improving with sanatorium treatment and at the same time unsuitable for artificial pneumothorax treatment. Within narrower limits, sanocrysin is useful in any case returning a persistently positive sputum, with a view to clearing up the tubercle bacilli, and for any patient in whom the induction of artificial pneumothorax has failed. Further, it may be used in conjunction with artificial pneumothorax treatment if the disease is bilateral, the induction being made on the side showing the more extensive disease.

H. Mollgaard, who first introduced the drug in 1923, claims that it does most good in the exudative type of case. I have not, however, confined its use to these, for I have obtained good results in cases with fibrosis. It is very difficult to differentiate between the two types, and one often meets a mixed type with both fibrosis and exudation.

ADMINISTRATION.

Sanocrysin is dissolved in 10 to 15 c.cm. of sterile distilled water, depending on the amount to be given. A 20 c.cm. record syringe with an eccentric nozzle and a Weintraud needle is used. This is a moderately short needle with a short point and a square mount. It is very convenient to use, for it does not tend to lacerate the wall of the vein. The site of injection is a superficial vein at the bend of the elbow. In women this is sometimes difficult to find, and occasionally I have had to use the external jugular vein.

No rigid system of dosage can be laid down; the more experience one obtains with the drug, the more one is impressed by the rule to "make haste slowly." The dosage should be regulated entirely by the reaction of the patient. In an undersized person, with poor resistance and perhaps an unsteady temperature, one should start with very small amounts—i.e., 0·025 g.—and very gradually increase the dose. In the average case an initial dose of 0·05 g. is given and, in the absence of reactions, is increased to the maximum of 0·75 g. The smaller doses should be given at intervals of four to five days, and large doses at intervals of seven to ten days. I have occasionally given maximum doses of 1·0 g., but I have nearly always regretted it, owing to the severity of the reaction produced. I have now discontinued giving patients doses larger than 0·75 g.

A patient may be considered to have had a complete course when from 5 to 6·5 g. have been given, although in several cases of the series it was only possible to give 3 to 4 g., nevertheless with moderately good results. The length of time taken to complete a course depends on the toleration of the patient to the drug. An uneventful course takes from 12 to 15 weeks to complete, but it may take much longer; for instance, one case I had took 33 weeks to complete a full course, and the results fully justified the length of time taken. Patients are kept in bed 24 hours after the injection, and if there is no reaction they are allowed to get up at the end of that time.

REACTIONS.

The great disadvantage of sanocrysin is the liability to reactions, but if it is administered with due caution these can be considerably lessened. They may be severe at times, but they almost always clear up fairly quickly. Albuminuria occurs in a large proportion of cases, but it is usually slight; occasionally the urine may be heavily laden with albumin. I have never had a case in which it lasted longer than nine days. Diarrhœa is a frequent complication, and for this reason I think sanocrysin is contra-indicated in tuberculous enteritis. Vomiting may occur, and is by no means infrequent almost immediately after the injection. Headache is often complained of, but it usually clears up, at the latest, on the day following the injection. Superficial ulcers of the mouth and lips are by no means rare. A variety of rashes is caused by sanocrysin. Erythema is very common and may be local or spread over the whole body; it is often associated with itching, and the rash is frequently followed by desquamation.

A most troublesome case was one in which several of the toes of both feet became gangrenous at the tips, associated with severe cramping pains along the course of the arteries of the lower extremities. The gangrenous condition persisted for several months, but ultimately cleared up. The pains in the limbs persisted, however, for over 12 months. The symptoms in this case rather suggested an obliterative endarteritis. Another patient had severe herpes on the side of the neck spreading up to the hair on the back of the scalp and extending downwards over the shoulder. This was followed by deep ulceration which left a good deal of scarring. The temperature is often raised for two or three days after an injection, and may occasionally persist for a longer time. Rigors may occur, but they are very rare.

There are two views as to the cause of the reactions produced by sanocrysin: some medical men regard them as due to the liberation of toxins of the tubercle bacilli at the site of the disease. In support of this, Secher [1] maintained that erythema is produced in pleurisy and in those cases where the lung lesion is "closed," whereas in an "open case" there is no

* Paper read before the North-Western Tuberculosis Society.

erythema, but I do not believe many will agree with this. Secher used large doses of sanocrysin in conjunction with an antitoxic serum prepared by Mollgaard to counteract reactions.

The other view is that the toxic effects are due to metallic poisoning by gold. Certainly many of the reactions produced, such as ulceration of the mouth, albuminuria, diarrhœa and vomiting, closely resemble the results produced by other heavy metals—e.g., mercury and lead. Oekonomopoulo,[2] in support of this view, has stated that the sedimentation test is the same before and 24 hours after the injection, thus showing that there is no increase in the tissue destruction of the body. He also found that the Pirquet test was the same before as after a dose of sanocrysin, and argued that if sanocrysin had a bacteriolytic action, then the body would be inundated with toxins and the Pirquet would become negative. But this is not so; therefore, sanocrysin does not liberate the toxins of the tubercle bacilli, and the reactions are due to metallic intoxication.

RESULTS.

Of my 36 patients, eight did not complete a full course, owing to the severity of the reactions produced or because it did not appear to be doing any good. As a matter of fact, in one of the eight cases it appeared to do definite harm, and I think was undoubtedly the cause of lighting up the disease. Clarke[3] has reported a case in which he believed sanocrysin definitely hastened the end. This leaves a total of 28 patients who completed a full course of treatment, and their classification was: 3 T.B. minus and 25 T.P. positive (5 T.B. plus 1; 17 T.B. plus 2 and 3 T.B. plus 3). The results of treatment were: 22 improved and 6 stationary.

In attempting to assess the results of the treatment it is as well at the outset to disregard the subjective sensations of the patients, because almost invariably they declare themselves improved with any form of drug treatment, especially if it necessitates the use of a needle. Too much stress should not be laid on physical signs, as in my opinion these tend to become more elusive as time goes on; this I think is a fairly common experience.

The sputum examination affords a reliable indication of the progress of the patient, for it can be said that sanocrysin has a definite and immediate effect in a large proportion of patients in causing the disappearance of the tubercle bacilli from the sputum; where the tubercle bacilli do not entirely disappear their number is much less after sanocrysin. Of the 25 patients with a positive sputum 13 became negative after a course of sanocrysin, giving a bacillary loss of 52 per cent. This percentage compares very favourably with an average of 20 per cent. bacillary loss for patients who were discharged from High Carley after sanatorium treatment alone. In addition to bacillary loss, the amount of sputum tends to become less. The loss of tubercle bacilli from the sputum is not always permanent, and where it becomes positive again, a second course of sanocrysin is indicated. But it is not common in my experience for the sputum to become negative a second time. In one case in this series the sputum remained positive after three years' continuous sanatorium treatment; then after a course of sanocrysin treatment it became negative. More than 12 months have elapsed since this patient completed the course of sanocrysin, but the sputum is still negative and the patient able to work.

There is a tendency for the temperature and pulse to become steadier after sanocrysin treatment, especially in those cases which had a slight temperature of, say, 99·6° to 99·8° in the evenings.

The sedimentation test before and after sanocrysin is a useful indication of the improvement or otherwise of the patient. Cutler[4] regards it as an index of the amount of tissue destruction going on in the body. The technique I have employed is a modification of the Cummings method; 4 parts of blood to 1 part of 3·8 per cent. sodium citrate mixed thoroughly in a wax-coated watch glass, the mixture drawn up into a length of barometer tubing and allowed to stand for one hour. The height of the column of red cells was measured and expressed as a percentage of the whole column of fluid. In one patient before sanocrysin treatment the column of red cells after standing one hour represented 45 per cent. of the whole column of fluid, whereas after sanocrysin the column of red cells, after standing one hour, was 78 per cent. of the whole. Thus there was a diminution in the rate of fall to the extent of 33 per cent. The figure for the whole series showed an average diminution of the rate of fall of the red cells of 18 per cent. after sanocrysin. This figure is very striking, and proves that sanocrysin has a beneficial effect in pulmonary tuberculosis. To check the accuracy of the test, 16 control tests were done on patients undergoing sanatorium treatment alone, and there was an average diminution of the rate of fall of only 4 per cent. after three months, as against 18 per cent. in the sanocrysin cases. On the other hand, sanocrysin-treated patients who do not improve usually show a marked acceleration in the rate of fall of the red cells. One patient, who showed an increase of 20 per cent. in the rate of fall after sanocrysin, died four months later as a result of a hæmorrhage.

Patients do not as a rule put on weight during treatment with sanocrysin. In this series of 28 cases, 66 per cent. lost weight, but this is only to be expected with a drug possessing toxic properties.

Allowing for pitfalls when comparing two skiagrams which are not absolutely of the same density, I think sanocrysin cases show more rapid improvement in the X ray picture than patients who have sanatorium treatment alone. Sometimes there is quite a marked improvement in the skiagram; after sanocrysin the areas of disease become less dense and more localised, and they tend to shrink. In fibrotic cases with surrounding exudative lesions there is frequently a clearing-up of the exudative part of the lesion.

AFTER-HISTORY.

Of the 28 cases, 15 completed the course a year or more ago. Their histories have been followed up, and the general condition of two is described as good, two improved, six stationary, four unsatisfactory, and one dead. Of the 14 survivors, six are fit for work and eight are unfit. The fact that six of the 14 are at present working, I think, indicates that the effects of the drug are to a certain extent lasting. Again, of these 14 cases, 13 had tubercle bacilli in their sputum, and the other was negative. Seven lost the tubercle bacilli as the result of the sanocrysin treatment, four of them are still negative, but three who became negative have again become positive. The remaining seven who did not lose their tubercle bacilli after sanocrysin are still positive.

These figures compare favourably with the cases that were discharged after ordinary sanatorium treatment. As stated previously, the selection of my group of 28 cases was made because they were not improving with ordinary sanatorium treatment,

and in some of them the disease had become more widespread during sanatorium treatment alone.

SUMMARY.

The results obtained in this series of cases lead me to conclude that sanocrysin has a definite place in the treatment of pulmonary tuberculosis. I will summarise as follows:—

1. Sanocrysin treatment is the most useful adjunct to sanatorium treatment next to artificial pneumothorax. This opinion is based on a trial of the drug on 28 patients at the High Carley Sanatorium.

2. Reactions may be reduced to a minimum by careful spacing and slow increase of the doses. Its use in any specific case should not be abandoned without a careful trial.

3. The rate of fall in the red blood-cells is considerably retarded after sanocrysin treatment, as revealed by sedimentation tests, the average rate of retardation being 18 per cent. in the sanocrysin cases and 4 per cent. in cases receiving sanatorium treatment alone.

4. There is a definite improvement in the X ray picture after sanocrysin in a large proportion of cases.

5. It has a definite effect on the sputum in causing the disappearance of tubercle bacilli; 52 per cent. of the sanocrysin cases lost their tubercle bacilli, compared with 20 per cent. bacillary loss in cases receiving sanatorium treatment alone.

6. The effect of sanocrysin is to a certain extent lasting, as six out of the 15 cases are at work twelve months or more after completing a course of sanocrysin, and in four of the original sputum-positive cases the sputum is negative.

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VARIATIONS IN THE ANTIGEN CONTENT OF SERUM IN DISEASE.

By A. Q. Wells, D.M. Oxf.

(From the Department of Pathology, University of Cambridge.)

Dean and Webb [1] have shown that, in the serum precipitation reaction, antigen and antibody unite in optimal proportions. They used falling dilutions of antigenic serum added to a constant dilution of antiserum. The tube first showing particulation is called the optimal tube. This tube has a definite antigen-antibody ratio, which is the ratio of the antiserum. If the amount and dilution of the antiserum are kept constant, it follows that a decrease in the ratio figure indicates a fall in antigen content of the antigenic serum, and conversely a rise in the ratio figure indicates a rise in the antigen content.

The methods of Dean and Webb have been used in the preliminary experiments here reported. These deal with the variation in antigen content of normal and abnormal sera, and an attempt has been made in one case to correlate the antigen content with the total protein content. In all cases the antisera have been produced in rabbits by the intraperitoneal injection of the appropriate serum.

THE ANTIGEN CONTENT OF NORMAL SERA.

The serum from eight different normal sheep were titrated against an anti-sheep serum; all gave the same ratio. The serum from six different normal hens were titrated against an anti-hen serum; all gave the same ratio. The serum from 13 different normal men were titrated, four against one anti-human serum, and nine against another anti-human serum. The antigenic sera were from men of varying ages, research workers, medical students, and laboratory assistants, all of whom were in good health, the first group of four being chosen as belonging one to each of the four blood-groups. The sera in the two groups gave the same ratio with their respective antiserum. In the two different antisera used, the antigen-antibody ratio of one differed widely from that of the other. An attempt was made to see if the antibody was the same in the two antisera, by mixing them in equal dilutions and titrating human serum against the mixture. According to Taylor [2] the result of mixing two similar antisera should be a ratio which is the harmonic mean of the two separate antisera—i.e., the ratio should be $\frac{2XY}{X+Y}$, where X is the ratio of one antiserum and Y is the ratio of the other. In this case, however, the result was two zones, whose ratios corresponded fairly closely to twice the ratio of each separate antiserum. Now each antiserum, if acting alone, is in twice the dilution indicated, the diluent being the other antiserum. It would appear, then that these two antisera contained different antibodies, probably reacting with two different antigens.

THE ANTIGEN CONTENT OF ABNORMAL SERA.

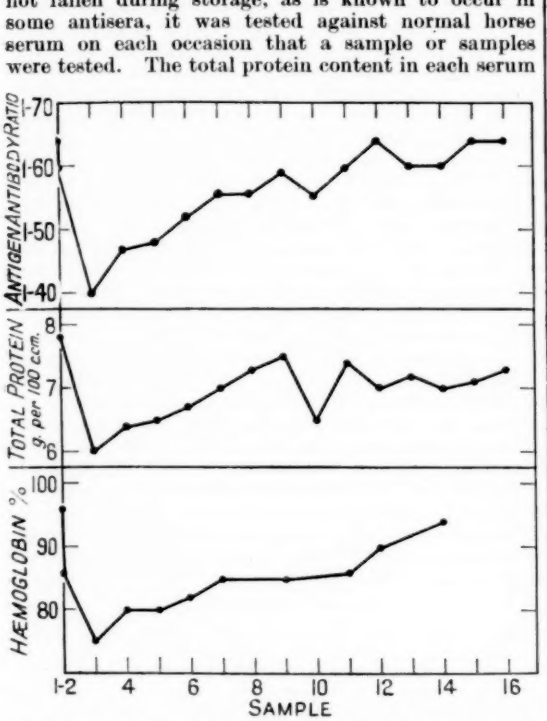
The constancy of the results obtained with normal sera, although the number of normal sera as yet examined has not been large, suggested the possibility that sera from cases of disease might show variations from normal. Accordingly the sera from four men suffering from nephritis were titrated against the same two anti-human sera used in the experiments cited above. These gave results differing markedly from those obtained with normal human serum. The figures are given in the following Table.

Antigenic serum.	*Anti-human serum 1092H.*	*Anti-human serum 1384C.*
Normal	1–13	1–4·5
Nephritic 1	1–8	1–8
Nephritic 2	1–7	1–8
Nephritic 3	1–10	1–6
Nephritic 4	1–8	1–7

It is seen that according to one antiserum the antigen content of the nephritic serum is decreased, while according to the other antiserum it is increased. This apparent anomaly is discussed later.

The mixture of equal amounts and dilutions of normal and nephritic sera titrated against each of the antisera gave a ratio midway between the ratio of each separate serum. This would indicate that the antigen is the same in the two sera. An association between the change shown by the serum precipitation reaction with the normal and nephritic sera, and the anæmia which is common in cases of nephritis presented itself as a possible explanation. It appeared desirable to investigate serum from an animal in which an anæmia had been produced by hæmorrhage. Dr. R. G. White, of the Belmont Laboratories, very kindly undertook to provide samples of blood and of serum taken from a horse immediately before and at intervals after a considerable bleeding. The horse, a normal one, was bled to provide serum for Löffler's medium. After sample 1 had been taken, 11 litres were removed from the jugular vein. Sample 2 was obtained at the end of the bleeding, about 45 minutes after sample 1. The subsequent samples were obtained at daily intervals.

The hæmoglobin percentage was determined in each blood sample by Haldane's method. The antigen content of each sample was determined by means of an anti-horse serum. In order to make sure that the antibody content of the antiserum had not fallen during storage, as is known to occur in some antisera, it was tested against normal horse serum on each occasion that a sample or samples were tested. The total protein content in each serum



The top curve shows the antigen-antibody ratio of the serum; the middle curve shows the total protein content of the serum; and the bottom curve the hæmoglobin percentage of the blood. The interval between samples 1 and 2 is 45 minutes, during which time the horse was bled 11 litres. The interval between each other sample is 24 hours.

sample was determined refractometrically by Dr. L. F. Hewitt, of the Belmont Laboratories, to whom I am much indebted for his figures. The results are best shown in graphic form (see Figure).

DISCUSSION AND CONCLUSIONS.

Dean and Webb titrated seven samples of normal horse serum with anti-horse serum, and found the ratio to be the same in each case. Although the number of normal sera reported upon here is small, it appears to confirm the findings of Dean and Webb that the antigen content of any one species is remarkably constant under normal conditions.

In the experiments with human serum, the appearance of two zones in the mixture of two antisera suggests that there are two antigens and two antibodies at work. If this view is accepted, it would seem to be a very likely explanation of the multiple zones occurring in some antisera, and reported by Goldsworthy.[3] It is known that serum albumin and serum globulin can act as antigens, and it seems possible that some rabbits react against albumin, and others against globulin. Whether there are other antigens in serum, and if so how many, is not relevant to the present discussion. If one of the antisera used contained anti-albumin bodies and the other anti-globulin bodies, then the results obtained with the nephritic sera are easily explained. It is known that in some nephritic sera the albumin content is decreased and the globulin content normal or increased. Peters and van Slyke [4] and Harrison [5] give the following figures:—

	Albumin.	*Globulin.*
Normal—		
Peters and van Slyke ..	3·77–5·24%	1·92–3·51%
Harrison	3·4 –6·7%	1·2 –2·9%
Nephritic—		
Peters and van Slyke ..	0·6 –4·6%	2 –3·4%
Harrison	1·51–6%	1·1 –3·55%

Thus the figures obtained by chemical analysis would be compatible with those obtained by the serum precipitation reaction. These preliminary investigations suggest that antisera against extracted serum albumin and serum globulin may give int esting results in some cases of disease. The reaction promises to give an easy method of determining the protein content of a fluid.

In the experiments with horse serum, it is seen that the antigen curve and the total protein curve follow each other remarkably closely. Sample 10 showed a drop in both curves. It was noted in collecting the sample that No. 10 clotted unusually slowly—about seven hours passed before the clot separated. The explanation of this is not apparent.

The results obtained are too few to justify far-reaching conclusions. It appears possible, indeed probable, that the method of optimal proportions may be applied to the antigenic analysis of sera from cases of disease and that variations from the normal may be expected. The work will be continued and it is obvious that a large number of observations on both normal and abnormal sera must be made before any definite conclusion can be drawn.

SUMMARY.

(1) The sera from various animals and from man have been titrated against the appropriate antisera. The antigen content of each species has been constant.

(2) Antisera against any one serum do not always contain the same antibody. It is suggested that two anti-human sera contained, in one case anti-albumin bodies, and in the other anti-globulin bodies.

(3) The serum from some nephritic patients differed markedly from normal human sera in their antigen content.

(4) The antigen content and the total protein content in the serum of a horse after severe bleeding showed remarkable agreement.

I am much indebted to Prof. F. R. Fraser, of St. Bartholomew's Hospital, and to Dr. G. S. Haynes, of Addenbrooke's Hospital, Cambridge, for kindly supplying me with the sera from the cases of nephritis.

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HOSPITAL MEMORIAL TABLETS. — Sir William Goschen, chairman of the London Hospital, recently unveiled a tablet over the Paramount Philanthropic Society's bed in an accident ward of the hospital in memory of the late chairman, Lord Knutsford. The tablet, which has been erected by the society, states that the bed is maintained "in ever grateful memory of Viscount Knutsford's wonderful example." Last week Dame Madge Kendal unveiled a tablet in Grimsby Hospital commemorating her endowment of a bed in memory of her husband, the late Mr. W. H. Kendal.

CLINICAL AND LABORATORY NOTES

A NEW DEVICE FOR TRAINING AND TESTING BINOCULAR VISION.

THE DRAWING STEREOSCOPE.

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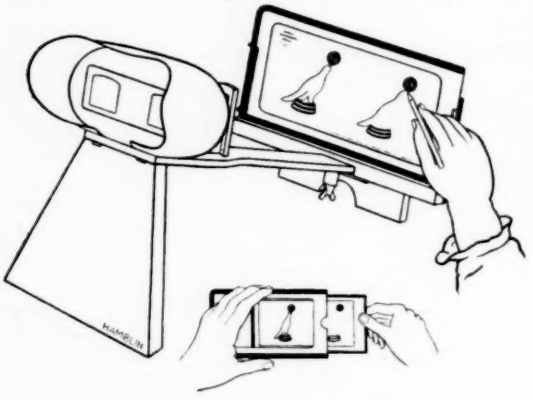
THE principle of coördination of eye and hand is made use of in the drawing stereoscope. In this method the "Printator" wax tablets are used. A style is used to draw with, and the marks can be made invisible in the fraction of a second. Thus, innumerable drawings can be made on one tablet. This device incorporated in the drawing stereoscope



gets over many of the practical difficulties well known in the use of stereoscopic pictures, in those cases to which the method is particularly applicable. Chief among these difficulties may be mentioned :—

1. The difficulty with young children of knowing what is happening. In this method no questions are asked, and it will be apparent from what the child draws as to how far there is binocular vision and fusion. 2. A second difficulty is that of keeping up, or even inducing, the childs interest in the exercises, especially so with young children. Small children like drawing, especially tracing. In this method they see the results of their efforts, which often lead to much amusement. 3. Because of difficulties 1 and 2, there is the third difficulty of getting the parent (or nurse) to continue the exercises, both parties in the exercise tending to get bored. In this method the mother sees what is going on, and the pictures can be varied easily by simple ingenuity of parent or nurse—e.g., a pipe in the mouth of the clown, smoke coming from the chimney, a number on the engine, candles on the Christmas tree, &c. The interest of both parties is thus kept up.

The ability to vary, and to make one's own pictures, is one of the principal attractions of the device, and small children are greatly interested in the "mystery disappearance" of the pictures, and like to continue the game for this reason also. Noughts and crosses can be played, the noughts and crosses board being the "lock," the child putting his cross on one side, and the nurse putting her nought on the other. The game is properly seen if binocular vision is kept up.

The tablets are made in two series, junior and senior. The junior set is for quite young children, and consists of pictures such as young children draw, and without any complicated detail. The senior set contains more detail, making it harder to draw the pictures correctly, and needing more sustained effort for each picture. The method is as follows. Suppose we have a child whose left eye tends to squint without glasses. The tablet is taken out of the stereoscope, and the teacher draws over, say, the ball on top of the seal's nose, and then draws over the seal. The child watches and is told to do just the same in the stereoscope. The ball being on each side acts as a "lock," and if fusion is good, the child draws the seal on the right side with the ball on its nose. For convergent squints the tablet should be placed as far away as possible to begin with, and brought nearer as training proceeds.

It is suggested that this method will be found a most useful device in selected cases in the training of binocular vision, and that it is a convenient and amusing way of testing for the presence of binocular vision and the amount of fusion at any age.

Messrs. Theodore Hamblin, Ltd., sell the tablets, with pictures. They can be used in any stereoscope which takes their well-known series of stereoscopic pictures, but it is better to use their drawing board stereoscope which they have made for me, for this gives a firmer support.

THE VIRUS OF RIFT VALLEY FEVER OR ENZOÖTIC HEPATITIS.

BY G. M. FINDLAY, O.B.E., D.SC., M.D. EDIN.,

AND

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(*From the Wellcome Bureau of Scientific Research, London.*)

IN many tropical countries there occur from time to time epidemic fevers of short duration, the ætiology of which still remains obscure, though the general similarity of the symptoms to those of dengue and sand-fly fever suggests the possibility that such fevers may also be caused by ultramicroscopic viruses. The recent observations of Daubney, Hudson, and Garnham [1] have shown that one such fever of short duration occurring in the Rift Valley in Kenya, British East Africa, is undoubtedly due to an ultramicroscopic virus. Rift Valley fever, or enzoötic hepatitis, as the disease has been provisionally termed, was first detected as a fatal epidemic of sheep and young lambs. Later the virus was found to be pathogenic also for man and for cattle.

The virus was brought to this country by one of us (R. D.) and has now been the subject of laboratory investigations. Infected blood from sheep dying of the condition in Kenya was first inoculated into two lambs by Mr. T. Dalling, M.R.C.V.S., of the Wellcome Physiological Research Laboratories, Beckenham. The lambs died of the disease but unfortunately, as a result of performing the post-mortems on these animals, both Mr. Dalling and his laboratory assistant went down with attacks of fever in every way resembling those described as occurring

[1] Daubney, R., Hudson, J. R., and Garnham, P. C.: Jour. Path. and Bact., 1931, xxxiv., 545.

in man in Kenya as a result of infection with the virus of Rift Valley fever. Both patients recovered from the disease and only one further human case has occurred in this country. Attempts to infect laboratory animals were then undertaken, material being available from three sources—viz., (1) blood from infected sheep in Kenya, (2) blood from lambs infected in this country, and (3) blood from the laboratory attendant previously mentioned.

The results obtained with the sheep and human bloods have been similar and have shown that a number of species of animals are susceptible to Rift Valley fever. In monkeys (*Macacus rhesus*) inoculation is followed two to five days later by fever, usually of from two to three days' duration, and by a leucopenia affecting especially the polymorphonuclear leucocytes. Cats are very slightly susceptible but the virus is most pathogenic for mice and rats. Ninety-nine per cent. of infected mice die within four days of an inoculation, some within 36 hours. The mortality of rats infected subcutaneously or intraperitoneally is somewhat less, though intracerebral or intratesticular inoculation is almost always fatal. In monkeys the disease is not fatal but in the liver there are found focal lesions similar to those occurring in adult sheep. In mice and rats there is acute necrosis of the liver associated with an infiltration of polymorphonuclear leucocytes. Hæmorrhages are also found in the mesenteric lymph glands and occasionally in other organs. Mice are susceptible to intraperitoneal injections of 0·1 c.cm. of a dilution of infected blood 1 in 10,000,000 in phosphate buffer at pH 7·2. Mice and rats can also be infected by placing infected blood on the freshly shaven skin or in the conjunctival sac. A number of wild rodents, such as the wood mouse (*Apodemus sylvaticus*), the field-vole (*Microtus agrestis*), and the dormouse (*Muscardinus avellanarius*) are also highly susceptible. The grey squirrel (*Sciurus carolinensis*) harbours the virus in its blood for a short time after inoculation but does not have any temperature reaction. Rabbits and guinea-pigs are insusceptible, as are birds, chickens, canaries, parakeets, and pigeons. After repeated passages through rats, mice, and monkeys, it has been possible to reinfect sheep and goats with the passage virus which produces the characteristic fever and leucopenia and the same necrotic changes in the liver.

The serum of man and of animals who have recovered from the disease possesses viricidal properties.

A full account of these researches will be published shortly.

HÆMORRHAGIC COLITIS CURED BY ZINC IONISATION.

BY GEOFFREY S. ROBINSON, B.M., B.CH. OXF.,
SENIOR ASSISTANT SURGEON, ROYAL INFIRMARY, SUNDERLAND.

THE patient was an unmarried schoolmaster of nervous type, aged 29, who had never been abroad. He has himself described the symptoms and treatment so well that I give the account in his own words.

"Trouble with the bowels was first noticed in 1929, but for some time it was confined to the passage, previous to a normal motion, of a little liquid (mucus) which was not especially noticeable in the pan. This became more frequent as time progressed, but there was as yet no pain. In the late autumn of that year I had an attack of a feverish condition resembling 'flu,' and almost immediately thereafter noticed that there was a small amount of hæmorrhage, occurring quite irregularly and still without pain or discomfort. A similar but much more severe feverish attack in the early spring of 1930 necessitated medical attention, and the notice of the school doctor was drawn to the occurrence of blood in the fæces, but a digital examination did not reveal anything.

"At Easter of 1930 these conditions were well established and, including the night period, an average of perhaps four motions per day was necessary. During the summer term this state got steadily worse, with quite severe pain at times during a motion, and at least twice a complete loss of control. Accompanying this was a pronounced lack of energy, which at the close of a day was at times severe enough to prevent the unaided ascent of a flight of stairs. An actual average taken over a fortnight gave a mean of seven motions or attempted motions in the 24 hours, including two, three, or sometimes four motions in the night. At the close of the summer holidays, after a somewhat strenuous journey to London followed by poor accommodation for the night, a severe attack was experienced in Charing Cross Station, which necessitated 12 retirements in the course of one forenoon, most of which were discharges of blood. There was very great nausea at the same time, and great resulting weakness.

"An attempt was made to carry on with the autumn term work, but a poisoned hand led to a conversation with Dr. I. H. Lloyd, of Penmaenmawr, upon the other trouble, with the result that he suggested a bacteriological test of the discharge. This was done, with the result that pus was found to be present, but there was no undue presence of any pathological organism. Upon his recommendation, I then came home for examination and treatment, entering a nursing home early in October. The examination was made under general anæsthesia by Drs. W. and G. S. Robinson and revealed the presence of a severe and bleeding inflammation of the lower bowel.

TREATMENT.

"The treatment for the first ten days consisted of medicine, hypodermic injection of emetine hydrochloride gr. ¼ twice per day, and a nightly dose of mixed liquid paraffin and castor oil; and twice daily a washing-out through a catheter, followed by an injection of witch hazel. At first the utmost difficulty was experienced in retaining the injection, but the ability to do so rapidly increased until later it could easily be held until the time for the next treatment. There seemed to be no very marked alteration in the general condition.

"Upon the succeeding Sunday morning the first of a series of electric treatments was given, which consisted in the ionisation of an injected solution of zinc sulphate. The anode (a special catheter electrode) was covered with a semi-permeable membrane, which was filled with the electrolyte after insertion, the zinc anions thus being deposited on the walls of the bowel. Current was obtained from the town main through a metal disc rectifier and transformer, thus giving a supply of 120 volts D.C. This was passed through a rheostat and a milliampèremeter, the cathode being a zinc plate wrapped in moist cotton-wool and applied under the left thigh—the patient being in the left lateral position.

"The first treatment consisted of the passing of 1½ milliampères for seven minutes. This was quite exhausting, probably mostly on account of the psychological strain involved, and also perhaps partly due to the very unpleasant preliminaries. After this, and after the succeeding weekly treatments on Sundays, while the time and current strength were both being increased, there was very considerable exhaustion during the Sunday, and, curiously enough, a much slighter recurrence on the Tuesday, after quite a comfortable Monday.

"The other treatment was meanwhile lessened, and finally discontinued, while the electric treatments were continued on the Sunday mornings. The current and time were both gradually increased until at the last treatment 18 milliampères were given for 27 minutes. By this time the system had become so inured to the conditions that this heavier current and longer time caused much less discomfort than the first treatment, in spite of the fact that there were cramps of the thigh muscles caused by the large current. The actual "pin-and-needle" pain of the current in any treatment got much less, with an unaltered current strength, and at times would be almost imperceptible, except that on the cessation of the current there would be a sensation as of a strain released.

RESULTS.

"Although there was no marked progress while the treatment was being worked up to its maximum strength, when this was attained there was a marked improvement, both the irregularity and the hæmorrhage being greatly diminished. I left the nursing home on Dec. 22nd, and had three more treatments during January, 1931, attending at the nursing home on Sunday mornings for the purpose. At the end of these, the irregularity had disappeared and the hæmorrhage was slight and intermittent; it became rarer

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF LARYNGOLOGY.

A MEETING of this section on Dec. 4th, with Mr. WALTER HOWARTH, the President, in the chair, was devoted to the

Treatment of Malignant Disease of the Hypopharynx.

Mr. WILFRED TROTTER said that cancer of the pharynx presented to the surgeon a problem as urgent as it was difficult. As the disease was by no means uncommon, its natural course painful, repulsive, and always fatal, it could well be regarded as one of the worst afflictions of middle-age. The pharynx presented three formidable obstacles to surgery: it was very inaccessible, it was the seat of delicate and complicated function, and it contained septic material, highly virulent to surrounding tissues. Yet in the last 20 years such progress had been made in dealing with malignant disease in this region that a fair number of patients had been enabled to enjoy many years of life who otherwise would inevitably have died in a few months. This improvement had been due to two lines of treatment—surgical excision of the lesion, and radiotherapy, the latter usually being combined with some form of surgery.

LOCALISATION AND EXCISION.

For purposes of discussion Mr. Trotter defined the hypopharynx as that region which lay below the epiglottis, in other words the laryngeal part of the pharynx. Access to it was obtained by the lateral transthyroid pharyngotomy. The lesion here was a squamous epithelioma, and in his remarks he assumed that was so in every case. Control of post-operative infections and a knowledge of the natural history of the disease had contributed to the progress which had been made. The study made possible by better access to the region showed that the disease occurred in well-defined clinical types, whose exact recognition was of great importance in prognosis and treatment. Knowledge of the precise site of the tumour was almost as important as knowledge of its nature.

Epithelioma of the hypopharynx had five common starting-points, in the following order (from above down): the aryepiglottic fold, the pyriform sinus, the lateral wall, the posterior wall, the post-cricoid region. Though these areas were little removed from each other, growths originating in them showed differences in symptoms, prognosis, and in treatment. Growths of the aryepiglottic fold were favourable in that they caused early hoarseness and stridor, and in early cases the growth could be removed without serious mutilation. Growths of the pyriform sinus were very common and of evil repute, largely because it was usually not until a late stage that the disease was recognised with the laryngoscope. Sometimes when it was discovered there was already a mass of hopelessly fixed glands. He quoted a case of cancer in this locality in which he used lateral transthyroid pharyngotomy for the first time and the patient was still alive after 20 years. Growths of the lateral wall were the most important type revealed by operative exploration of the pharynx—important because, though amenable to excision, their nature was often overlooked and the prospects were regarded as unfavourable. In its earliest stages such a growth could be removed without interference with the larynx. Diagnosis was especially difficult because the cord and arytenoid were often hidden behind the tumour projection.

The foregoing forms were almost confined to the male, but with growths of the posterior wall women began to come into the picture. The upper limit of the growth here might be at, or a little above, the level of the tip of the epiglottis, while its lower limit might extend into the post-cricoid region. Any excision of the posterior pharyngeal wall called for immediate plastic reconstitution by means of a skin flap. Growths of the post-cricoid region had three remarkable peculiarities: it was a disease of women, occurred in them at a younger age than did cancer of the pharynx in men, and in many cases was preceded by swallowing difficulty, slight in degree but of many years' duration. Its rapidly increasing dysphagia might not be supported by any evidence short of that furnished by direct endoscopy. Growths in this region varied a great deal in their malignancy, and sometimes the appearance was misleading.

Local excision for cancer of the pharynx could be recommended with reasonable confidence only when the patient was edentulous, when the growth was still confined within the pharyngeal wall, and the glandular involvement was limited, the glands being hard, well-defined, and not fixed. These were the criteria, but he had defied them successfully on a number of occasions; thus within them the margin of safety was good. With post-cricoid growth a great strictness must be insisted on. Apart from this latter form, he thought the seriousness of lymphatic gland involvement had been exaggerated. It became increasingly evident, however, that recurrence might take place far later than had been suspected; he had a case of direct local recurrence after eight years. His view of these recurrences was that the growth of the cancer aroused in the body a degree of resistance, not strong enough, in most cases, to check the growth; but when surgery had removed this, the relative immunity survived and could keep in check the minute amounts of tumour left at operation. With the gradual decline in this immunity a point was eventually reached when the activity of the cancer was again asserted.

The final results of operative treatment must be considered from two standpoints—freedom from recurrence, and the condition in which the patient survived. Operation based on precise localisation increased the prospect of cure and diminished the need for mutilation. Failing this exact localisation it did not follow that the more sweeping the operation the greater the prospect of cure. Where a tumour could be got away by local excision, he did not think the mere addition of laryngectomy gave any further security.

(*Continued from previous page.*)

and rarer until it entirely disappeared before the end of March.

Since the resumption of his scholastic duties there has been a marked improvement in general health, and a normal condition of the bowels, with no tendency to any further hæmorrhage. He has gained 18 lb. in weight since February, 1931.

RADIOTHERAPY.

Prof. CARL VON EICKEN (Berlin), confining himself to the treatment of these tumours by radiotherapy, said that either a pack or a modelled radium carrier could be employed, at a distance of not less than 3 cm. from the skin. This remained in position on each side of the neck for a week and he had used it only as a preliminary to surgical intervention. In applying radium through the mouth, carriers were introduced on a long wire and placed in direct contact with the tumour; but as this did not permit of a full dosage, he had discontinued its use. In employing radium and surgery combined, the area of the tumour and the posterior wall of the pharynx were exposed from the neck and when necessary the omohyoid muscle was cut through, as also, after ligature, were the common facial vein and the external carotid artery. Three or four radium carriers, each bearing 10 mg. of radium, were distributed in the region of the tumour, and great vessels were protected by interposing sheets of soft rubber. The wound was completely closed. The radium carriers were left in position three or four days—i.e., until a dose of 3000 to 4000 mg. hours had been received. The carriers had a metallic filter for the gamma rays, and in addition a 2 mm. rubber coating. This method had been employed in 11 cases, none of which showed any complication over a long time. Two of the 11 patients were free from symptoms and the tumour had completely disappeared; in five others the tumour had markedly decreased in size but symptoms were still present. In the other four advanced cases there had been no success. With regard to X ray therapy, the application of the so-called tolerance dose in one or very few sittings had not given satisfactory results; while the use of very large doses, exceeding the tolerance dose, led to severe complications, without curing the growth.

SYMPTOMS AND TREATMENT.

Mr. J. B. HUNTER said that the symptoms of carcinoma of the hypopharynx were vague, the first usually being a slight difficulty in swallowing. Frequently no growth was obvious on direct examination by laryngoscope. Every patient who had had swallowing difficulty extending over a few months should be subjected to direct examination. There were, however, a few small points which gave a clue by the indirect method. A pool of mucus, not cleared by swallowing, could be seen behind the larynx, or the edge of an ulcer, not seen in quiet breathing, could be made out when the patient phonated strongly. In other cases œdema of the arytenoids could be seen, and usually both were equally swollen. The œdema should not be regarded as a sign of inoperability, for it merely meant that a lesion was present in the locality. Valuable information could be gleaned by digital examination, especially in growth of the posterior wall. In making a direct examination no effort should be made to pass the instrument beyond the ulcer. It could not be too much insisted upon that until exposure and examination of the primary growth had been made it was impossible, in most cases, to decide on the best procedure. The importance of the retarding effect of sepsis was universally recognised; and patients with malignant disease in this region who had long been endentulous had a less severe convalescence than patients who retained their teeth. Tracheotomy was essential, using the horizontal incision; the usual vertical incision would interfere with the flap. Mr. Hunter proceeded to describe his method of operating. The lower limit of the growth was by far the most important; post-cricoid growths showed a tendency to spread downwards rather than upwards. If a growth was adjudged inoperable the pharynx should not be opened, but treatment by radium should be carried out. It could be started at once if the patient had long been edentulous, otherwise a week's delay was advisable, to allow the neck to become shut off. If radium element was used it was well, he considered, to protect the flap by suturing a layer of lead foil between it and the radium. This foil could be withdrawn with the radium. In after-treatment, the tracheotomy tube had to be kept in position until the skin flap had united, or until the radium reaction had settled down.

Mr. LIONEL COLLEDGE said that if a case was seen at a fairly early stage, without cord paralysis or severe dysphagia, the operation which Mr. Trotter devised 20 years ago was ideal. On three occasions he had found that, in association with severe dysphagia, the growth had spread down the œsophagus through the thoracic opening. Severe dysphagia he regarded as of ill omen, apart from the way in which it prejudiced the patient's nutrition. Sometimes the growth was more extensive than it seemed at first. The necessity of a bilateral gland operation must be assumed, but often enlargement of the cervical glands was late in appearing, in spite of the size of the growth.

Mr. MUSGRAVE WOODMAN dealt with some points of difficulty in technique. Mr. Trotter had pointed out the importance of keeping the saliva aseptic, but another matter was the trouble caused by air bubbling out of the throat and causing frothy saliva. A further point concerned the hair on the skin used as a flap; he did not know how to destroy a stiff beard without damaging the healing powers of the skin of the neck.

Sir STCLAIR THOMSON gave the notes of seven cases of cancer of the hypopharynx which he had referred to Mr. Trotter. He spoke of the good fortune to the profession of having a man like Mr. Trotter working on this frontier.

Mr. DOUGLAS HARMER referred to the beliefs he had recently enunciated in the Semon lecture. The subject, he said, required much more investigation.

Mr. STANFORD CADE said that in inoperable cases it was not only useless but dangerous to rely on inefficient doses of X rays, for the growth was thereby stimulated; irradiation must be pushed to the limit of tolerance. The post-cricoid group was most unsuitable for radium treatment. He considered that all treatment, whether by surgery or by radium, in this part of the body should be preceded by sterilisation by X rays.

Mr. W. M. MOLLISON spoke in support of deep X ray therapy for post-cricoid growths, and quoted favourable cases.

Mr. V. E. NEGUS added his plea that every effort should be made to arrive at an early diagnosis.

SECTION OF PSYCHIATRY.

AT a meeting of this section on Dec. 8th Dr. BERNARD HART, the President, took the chair, and a paper on the

Experience of Time in Mental Disorders

was read by Dr. AUBREY LEWIS.

Time, he said, once dismissed as a "small parenthesis in eternity," had become in our age an urgent matter. The universe was nowadays regarded as a four dimensional continuum of which time was an essential aspect. Sir Clifford Allbutt had said that

disease was a matter of time relations. Psychology and psychopathology were concerned with the problem. There were two aspects of time in mental disorder; the first was time as a determinant of the duration of illness—too often ignored—and the other was time as a modality of personal experience, an immediate or derivative datum of consciousness. Disorders of time-appreciation might be found in the functional psychoses as well as the organic. Patients would often say that everything seemed very much longer, that they could see no end to anything, that time seemed to be standing still, and so on. Nor were these symptoms confined to the educated or philosophical. To examine them it was necessary to have some knowledge of the psychology of time.

Time might be objective: clock time or world time; or personal time: the time that we lived in, experimental or psychological time. The two were usually in practical agreement but were psychologically quite separate. Time consciousness was a matter of immediate experience, an aspect of all conscious activity, essential to all reality. Time was by no means an attribute of sensation, though it was very probably one of perception. Beginning and ending were indispensable integral parts of duration; rhythm was a mixture of stability and change. Duration was the elementary primitive phenomenon; the conception of the present had been developed later, and with it the conception of the absent, and expectation. Memory had developed to integrate past experience with the living present which was set apart as a particular point or range: "now." Children mixed up the order of events, for to them there was pure and simple succession. The present had a constant relation to action and striving. There was an immediate, recent, remote, and indefinite past and future, and the conception of the past, like consciousness in general, consisted of a global feeling of which only certain modalities attained clarity. When the notion of time was penetrated by the idea of reality the present came to be regarded as real, and the past or future as unreal in increasing degree according to its remoteness.

Personal time was often brought into relation with world time; in boredom, for example, time "passed slowly," because it could not be given the content of choice. This time-consciousness was different from the time-sense which enabled a person to guess the duration of intervals in world time. This quantitative awareness of time had been explained by feelings of tension, contents of sensation, and psychoenergetic processes. There were two essential elements: an immediate awareness of the magnitude of duration or speed of succession, and an ability to recall similar former experiences for comparison. The immediate awareness was best carried out in sleep; the less affective interest and direct attention given to it, the better it was performed. It was a particular manifestation of the general time sense of the integrated organism, also manifested in the periodic physiological activities.

DEPERSONALISATION SYNDROME, DEPRESSION, AND COMPULSION.

Disorders of time processes were often met in cases of depersonalisation and sense of unreality. Patients would say that there seemed to be no break in time, that their minds were eternal and could not be altered, that everything seemed ages ago and yet time seemed to go faster, that the future was remote, that they had no idea of time, that the clock meant nothing to them. It was characteristic of the disorder that patients were unable to evoke the past readily or clearly, to distinguish the present from the past and future, to seize the present or to look into the future; paradoxically there was increased quickness of the passage of time although it seemed also to drag along. The recent past seemed remote and the patient thought he could not judge time. This syndrome had been regarded as a sequel or manifestation of loss of interest, but Dr. Lewis could not agree with this view, and regarded the syndrome as indicative of a disturbed state of consciousness in which the immediate data of perception had lost their primary attribute of reality. There was a change in space- and time-consciousness which could be expressed in various forms. The syndrome appeared in many kinds of mental disorder, and in all mental disorder there might be more or less disturbance of consciousness of this kind. The clearest analogue to depersonalisation and unreality was the *déjà vu* or *déjà raconté* phenomenon and immediate premonitions. The unreality syndrome was regularly associated with a feeling of imminent disaster. With variations in the manner of description, the uniformity in essentials was amazing.

In depressive patients there was altered time-consciousness alongside an unimpaired time judgment. Retardation was a personal experience and could not be objectively demonstrated. A number of experiments on depressives had shown that their professed incapacity to estimate duration was not in fact a real incapacity. The inconsistency in psychomotor and temporal experience could be referred to a common factor, one that was also responsible for the common belief: that one had spent a sleepless night when actually one had slept well. It was inevitable that with the closing-off of the individual future—i.e., anticipated activity—the past, and to a certain extent also the present, should become torturing and intolerable. This was important in the compulsive states, which were recognised to have an intimate relation to the manic-depressive reaction. Compulsive phenomena commonly showed time components in their form, and sometimes in their contents. A patient might worry about eternity and eternal numbers or the origin of things and chaos. The main characteristics of form were the inability to stop or to get satisfaction, and the feeling of incompleteness, of lack of finality. The essence of compulsion was in the incapacity to complete a particular act and so dispose of it. Thinking and conduct were both carried out in constant reference to the future, and for the normal person the past and the present were carried on into the future satisfactorily only when completed and dealt with. To the inhibited obsessional patient the future was barred, and so he was continually hindered in completion and thrust back to his starting-point. The inhibited depressed patient did no effectual acts either, but in his case this was the result of refraining from action whereas in the inhibited obsessional it was the result of indeterminateness and vain repetition.

ENCEPHALITIS, PRESBYOPHRENIA, AND SCHIZOPHRENIA.

Disturbances in time appreciation were found also in encephalitics. In the toxic organic disorders there were much grosser disturbances, often including an ignorance of world-time resting on complicated disorders of judgment and memory, but Dr. Lewis said he did not propose to discuss these, or the interesting drug-made time disorders. Some of the most interesting time disorders were found in presbyophrenic patients. These did not constitute a dis-

tinctive group but showed combinations of the various reaction types. In some the change was interpreted in the personal sense—" I shall never really die . . . . I can't estimate time . . . . time goes very much quicker . . . . I noticed my watch was accelerated . . . . the time you keep here is only a quarter of the real time "—in others it was projected and the patient would declare that he himself must die but that no one else would ever die. Sometimes schizophrenic elements were obtrusive. The distinctive features of time disorders in the schizophrenic were the feeling of previous death and rebirth ; the feeling of interruption in time after which it had begun again ; and "thinking backwards." Some patients felt that everything said to them referred back to some part of their lives, and others had anticipations of the premonition type. No objective time disorder could be demonstrated in these patients. In mania there was the subjective experience of capacity for rapid thought and movement, which was not confirmed by objective tests, with a corresponding disproportion between personal time and world-time. In hysterical dissociation there might be secondary time disorder, premonitions, and *déjà vu* phenomena. A striking feature of the hysteric was that time went very quickly for him, even when he was completely idle.

DISCUSSION.

During the course of the subsequent discussion the President mentioned Janet's association of the distortion of time-perception with the feeling of unreality, and Dr. R. D. GILLESPIE wondered how far Dr. Lewis's patients had intellectualised and elaborated their feelings, since introspection could give anyone a considerable degree of detachment from the reality of time. Dr. DORIS ODLUM suggested that subjective time depended on its emotional content to the individual. Dr. E. MAPOTHER quoted cases in which the inability to appreciate time seemed to be isolated, and coupled with complete equanimity ; it was a mystery, he said, how anyone ever made subjective time correspond with standard time, or perceived time duration without access to any clock, particularly in the post-hypnotic state and in the conditioned reflex of the dog. Dr. F. G. SCOTT compared time appreciation with visual perception, and thought that the problem might well be approached by studying the genesis of the perception in children.

Dr. LEWIS, in reply, said that his records had come in many cases from uneducated persons, and that the instances quoted were mainly from the routine records made by his colleagues who had no special interest in time. The time-sense of the organism was expressed in many ways, and could not, in the present state of our knowledge, be tied down to any particular organic factor.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

AT a meeting on Nov. 24th, with Dr. LETITIA FAIRFIELD, the President, in the chair, a paper on

Surgical Tuberculosis in Children

was read by Dr. LOTTE MAHLER (Frankfort). Tuberculosis manifesting itself in any organ was a sign, she said, that the tissues of the host had not been able to overcome the bacillus at the portal of entry, and that therefore he must be held to have yielded some ground in the fight against tubercle. It was, therefore, never permissible to remove a focus without at the same time subjecting the whole body to systematic treatment. She worked in a 2000-bed hospital where certain wards were allocated to men, women, and children with so-called surgical tuberculosis. It was considered necessary to have special wards for these cases, not only because 60 per cent. of them were found to suffer also from pulmonary tuberculosis, but also, and mainly, because it was necessary to provide facilities for sun treatment, special diet and nursing, and disinfection

In diagnosis the subcutaneous test was never used, for fear of activating the focus. The sedimentation test of the red blood-cells was not regarded as specific for tuberculosis, but its repeated performance had value because it indicated the course of the illness and the results of treatment.

For local conservative treatment—designed to stimulate a defensive reaction in the part involved, and in the whole body—the best means were sunlight and ultra-violet rays. In the absence of pulmonary tuberculosis, iodine was used in combination with passive hyperæmia. Soft soap was sometimes used for skin applications. Tuberculin was seldom employed therapeutically. Simple orthopædic appliances were used to support the part affected as most convenient to the patient. Only light fixation was used, so that small active movements were possible, and disuse atrophy was thus obviated as far as possible. In after-treatment a splint was used to keep the parts in a position, or, in case of a leg, to remove the weight of the body. Patients were treated in the out-patients' department for some years after leaving hospital.

Conservative treatment had to be abandoned where it was thought that operation might avoid amyloid degeneration, or in the presence of a severe mixed infection. It was sometimes helpful to remove one focus in order to place the patient in a better position to cope with another. Besides these absolute indications for operation there were some relative ones—e.g., for adults, the need to return to the family within a comparatively short time. Operations were also advised if the focus could be removed radically without crippling the patient. In children with joint tuberculosis, operations were never performed, even if the process of healing was likely to take many years. In adults, economic considerations might influence the decision, but no such considerations should be allowed in the case of children.

The large majority of patients in Prof. Schmieden's clinic, where she (Dr. Mahler) worked, suffered from tuberculosis of some part of the spinal column. As a rule, conservative treatment was used—i.e., the patients were placed on horsehair pillows, built up to fit the normal curves of the spine, with special support to the part involved. Plaster-of-Paris beds were never used. Children were fastened with straps. If there was any signs of irritation of the spinal cord, extension therapy was used with straps and weights. In this way the muscles could be kept from atrophy, and the skin of the whole body could be exposed to air and sun. When pain and irritation had disappeared it was easy to turn the patient to a comfortable position on his back or face for some hours every day.

In the treatment of cold abscesses incision was avoided if possible. Puncture through healthy tissue, and the injection of iodine and glycerin, was the method of choice, unless high temperature in

cases of mixed infection forced an operation. Even in cases of compression of the spinal cord operations were avoided, extension therapy giving better results.

In disease of the hip-joint a board similar to that used at Alton was regarded as the most effective was of securing immobility. Operation was rarely performed for lesions of the hip- or sacro-iliac joints. In the knee-joint cases young people were treated by conservative methods. In adults seen only when the joint had already been destroyed, operation gave better results in a shorter time. The patient had a stiff leg, but a useful one. Elbow-joints were treated by conservative methods if possible.

During heliotherapy unnecessary dressings were avoided. If plaster-of-Paris had to be used it was blackened on the surface to avoid reflection of light. This raised the temperature of the parts covered by the plaster, and the resulting hyperæmia had good results.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

AT a meeting of this society on Dec. 10th, with Dr. W. LANGDON BROWN, the President, in the chair, Dr. F. G. CROOKSHANK read a paper entitled

Physical Findings in Psychoneurosis,

which gave an account of observations made by him during the last two years as a diagnostic physician at the Institute of Medical Psychology (Tavistock-square Clinic). In this capacity he had, he said, examined several hundreds of new cases. The routine procedure was for each patient to be accorded a full hour's interview, during which time a pretty complete physical investigation was carried through, whilst occasion was taken to arrive at a preliminary psychological appreciation of the situation. In carrying out these examinations he had had, for more than a year past, the assistance of a woman colleague (either Dr. Hutton or Dr. Weber, as a rule) and the plan of examining both male and female adult patients, from the physical as well as the psychological angles, in this conjoint way had proved extremely successful, so far as could be judged.

In dealing with "psychological" cases it was very important, said Dr. Crookshank, to pay attention to the fine adjustment of the organs of sense—the means of reception, by the patient, of impressions from the outside world. He was convinced that the complete correction of ophthalmic defect was often of far greater consequence to the "nervous" patient than ophthalmic surgeons were prepared to admit. The frequent advice to migrainous people that "the defect was too small to call for glasses" or that the "glasses need only be worn when the headaches occurred" was really deplorable. Another point of some interest was the great frequency with which plugging of the ears with wax was found in "nervous" patients, and those complaining of noises in the head, "odd feelings," and so on. Actually, at least one person in four seeking help at the Clinic had both ears so plugged, either with or without complaint of deafness. A matter of some seriousness was the frequency with which hyperthyroid states, referable to emotional strain, were found present, without recognition, in patients, male or female, who had been passed by their own or special medical advisers as "without organic disease." This same phrase was constantly being applied to patients with severe refraction defect, heavily infected tonsils, carious or defective teeth or gross constipation, and to those suffering from the abuse of tea and tobacco. The sooner this wretched and now almost meaningless cliché disappeared the better. A large proportion—perhaps a quarter—of the new cases at the Clinic were found to have oxaluria. The association of oxaluria with anxiety states and neurasthenias was a matter once better recognised than now; the explanation was not dietetic, but metabolic.

In conclusion, Dr. Crookshank declared that the opportunities he had enjoyed at Tavistock-square had more than strengthened his conviction of the rightness of the individual psychologist's approach to the subject of the psychosomatic unity. So far as the neurotic patient was concerned, the really important thing, as Adler would say, was not the actual physical defect, organ-inferiority, or stigmata of "degeneration," &c., present in the beginning, but "what the patient did about it." At the same time, the *nature* of the physical defect, or inferiority, would determine or colour the life-style of the patient who decided upon a neurotic life-line. But physical defect was neither necessary to neurosis nor rendered neurosis inevitable. The case of the psychotic, however, was somewhat different. Whilst the speaker held, with Adler and Wexberg, that the life-style of the psychotic was to be explained in the same way as that of the neurotic, nevertheless he thought the psychotic might be looked upon often, if not always, as one who started with a special biological pattern or outfit. This, again, by no means implied the necessity for mental breakdown, or excused the adoption of a neurotic life, ending in psychosis. But it did mean that the adoption of certain methods of living was, for those so imperfectly equipped, much more dangerous than for others. An analogy might be attempted. An aviator of experience and skill would say that "crazy flying" might be perfectly safe, given a good machine in good order, but that to attempt "stunts" with certain types of machine, or with one in bad order, would be courting a crash. So with the human being. No imperfection of original equipment compelled, or need compel, anyone to live wrongly. But it might render the "neurotic" style of life highly dangerous and a seeking of disaster.

DISCUSSION.

In the discussion which followed the PRESIDENT alluded to a distinction made by Dr. T. A. Ross, at a recent sectional meeting of the Royal Society of Medicine, between the attitude of the psycho-neurotic and the attitude of the psychotic towards their dyspeptic symptoms. The psychoneurotic was willing to consider the possibility of a more remote origin, whereas the psychotic would never admit in any way this approach to the subject.—Dr. LAURA HUTTON said that in three cases of hyperthyroidism which she had treated psychotherapeutically the exciting cause had been violent love-making, which had been carried too far, and yet not far enough—i.e., to completion.—Dr. HILDA WEBER spoke of the importance of examination of the hands.—Dr. O. H. WOODCOCK gave a clinical example of dyspepsia in a psychotic which exemplified the "fixity" referred to by the President.—Dr. J. R. REES, in answer to a question, said that at the Institute of Medical Psychology it was the practice to see relatives, but it was not a routine measure.—Dr. E. A. BENNETT expressed a doubt whether coitus interruptus was such an important factor in the causation of anxiety neurosis as some authorities—e.g., Freud—suppose, and Dr. REES remarked that coitus interruptus was prescribed in Scandinavia as the ideal contraceptive.—

Dr. BEVAN BROWN said that in his experience many hysterics refused to discuss the possibility of a mental cause of their dyspepsia. He thought that frustrated sex desire was a potent cause of hyperthyroidism.

Dr. CROOKSHANK in reply agreed with Dr. Hutton's conclusions about the effect of emotion as a factor in the causation of hyperthyroidism. He had found that there was a greater tendency for psychosis to be accompanied by physical imperfections than was the case with psychoneurosis. Loss of sex desire following a gynæcological operation not involving the ovaries was often psychologically determined and amenable to psychotherapy. With regard to coitus interruptus and its effects it was well to refrain from generalisations; in some instances it might be the expression of a neurosis. He considered that the beliefs of hysterics were not held with the same tenacity as those of psychotics.

PATHOLOGICAL SOCIETY OF MANCHESTER.

AT a meeting of this society on Dec. 9th, Prof. A. E. BOYCOTT (London) gave an address on

Anæmia and Polycythæmia.

He described how polycythæmias fall into two classes—the apparent and the real. Apparent polycythæmias, he said, are due to a lack of plasma and a concentration of the blood. They are seen in new-born children—at a time when it is necessary for the child to be as small as possible, and the viscosity of the blood is of little or no importance—in cholera and in secondary shock. Since the maintenance of an adequate circulation depends on the proper filling of the right heart, any substantial diminution of blood volume is incompatible with life for more than a few hours. Locally, a polycythæmia may be produced by cutting down the oxygen supply of the capillary endothelium as by constricting the finger; plasma at once leaks out and erroneous blood counts are obtained. Real polycythæmias are due to deficient oxygen supply or splenomegalic polycythæmia. The best known is that which occurs at high altitudes. Various fantastic explanations of the phenomenon were given in early days, but it is certain now that it is due to a compensating action by the bone-marrow which increases the concentration of hæmoglobin in the circulating blood without enlarging the blood volume. This was first shown clearly in animal experiments, and afterwards by Haldane and Douglas in man. Anything which interferes with the due supply of oxygen can lead to the same result—chronic tracheal or bronchial obstruction, pneumothorax, chronic carbon monoxide poisoning, and many examples of congenital cardiac defect. The ordinary case of heart failure seldom shows any degree of polycythæmia, and is often slightly anæmic; it is short enough of oxygen, but it has enough difficulties to face in maintaining arterial pressure and control over the distribution of blood without adding to the work of the heart by raising the viscosity of the blood. Peculiar interest attaches to the demonstration by Doyon and Morel, and later by Campbell, that excess of oxygen leads to anæmia. The facts show pretty clearly that what we know as the "normal" level of hæmoglobin is determined by the pressure of oxygen in the atmosphere in which we happen to live. What is "normal" in Manchester is mild anæmia in Johannesburg, and the nations of the Andes have a "normal" percentage of hæmoglobin of 145. With any given oxygen supply the body evidently strikes the balance between oxygen-carrying power and viscocity, and the polycythæmia of high altitudes soon disappears on returning to sea level.

In splenomegalic polycythæmia there is no demonstrable difficulty about the oxygen supply, and the production of red cells by the marrow is causeless—i.e., the disease is a tumour of red corpuscles. The body protects itself as far as it can by increasing the volume of the blood so that at any rate the blood is not solid, and there is some plasma, but in the end the heart generally fails from having to pump round such viscous fluid.

The precise level of hæmoglobin which is appropriate to life at about sea level in this country has lately been carefully investigated by Price-Jones. He finds an average normal figure for men of 105 per cent. on the Haldane scale, for women of 98 per cent., which are higher than the standards fixed 30 years ago, but lower than the 112 or 114 per cent. which has been determined by several observers in America. He has shown that this difference is not due to technique, and is inclined to attribute it to slight chronic carbon monoxide poisoning, due to habitual use of closed motor-cars. The variability of the percentage of hæmoglobin is not large; it is about 4 per cent., which is about the same as the variability of stature in a homogeneous population. Its relationship to marrow activity is very precise; a rise in hæmoglobin immediately lowers the proportion of reticulocytes in the circulating blood and a fall stimulates their production.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

AT a meeting of this section on Dec. 4th Dr. A. R. PARSONS took the chair (in the absence of the President).

Empyema and Abscess of Lung.

Dr. GEOFFREY BEWLEY reported the case of a woman, aged 58, who was admitted to hospital in October, 1929, with a right-sided empyema following what appeared to be an attack of pneumonia.

Pus was obtained on exploratory puncture, but operation was postponed owing to the large quantity of purulent sputum brought up. Another puncture later obtained pneumococcal pus and gas, and X rays revealed an empyema containing gas. Operation was again postponed in the hopes of the sputum diminishing. On two subsequent occasions no pus could be obtained on exploration. Clinically and radiologically the empyema showed signs of complete healing, and in January, 1930, the woman left hospital apparently well.

In June she returned with signs of an abscess in her left lung, and a radiogram showed an abscess full of fluid in the left lower lobe, and another abscess cavity in the base of the right lung. The empyema had disappeared completely. Treatment by postural drainage was tried with success, and she was able to leave hospital in eight weeks. From that time onwards her condition has been very good, and she has had no cough. A radiogram taken a year later showed that the cavity in the left lung had disappeared completely, and that the one in the right lung was smaller.

The CHAIRMAN thought that in many cases abscess of the lung following operation was due to the introduction of tubes into the mouth and throat during anæsthesia, although he realised that some cases were hæmatogenous in origin. He was of opinion that operation should be deferred in cases of

abscess of the lung as long as possible, and that many cases recovered under medical treatment.

Dr. T. M. CORBET said that he had recently seen two cases of pneumococcal empyema in brothers. The parents refused to allow operation in each case, and the pus apparently gradually cleared up. But much thickening and pulmonary fibrosis were left, and he (Dr. Corbet) felt that both patients would be physically defective throughout life. He was of opinion that all such cases should be operated on.

Dr. E. T. FREEMAN thought that the empyema in Dr. Bewley's case must have followed the rupture of an abscess of the lung into the pleural cavity, for only in that way could the presence of air be accounted for. He felt that a pneumococcal empyema should be operated on, but a streptococcal empyema should not be operated on until the possibility of the lung collapsing when the opening was made was past.

Dr. H. QUINLAN referred to seven cases of abscess of the lung which had been under his care during the last two years, and said he thought empyema often resulted from rupture of pulmonary abscesses into the pleural cavity. He emphasised the importance of regarding each case as a therapeutic problem on its own merits.

Dr. V. M. SYNGE said he did not regard postural drainage as an efficacious method of treatment. It was very uncomfortable for the patient, and he personally had never seen any good result from it. He thought it was wrong to be too expectant in the treatment of these cases. During the last four years he had had seven cases of abscess of the lung under his care, one following tonsillectomy, two following pneumonia, two following septic emboli, and two following the aspiration of a foreign body. In one case he had had an autogenous vaccine prepared, and the patient had some treatment with this, but got an empyema and died. In other cases he had tried artificial pneumothorax, but as a rule a complete pneumothorax was difficult to obtain owing to the presence of adhesions. He felt that in chronic cases which did not respond to expectant treatment, operative treatment should be carried out.

Dr. J. MOWBRAY said that he was strongly in favour of early operative treatment, as against postural treatment.

Dr. R. H. MICKS referred to a case in which a surgeon opened the thorax, broke down pleural adhesions, and squeezed with his hand the lower lobe of the lung in which there was an abscess. The patient did well, but he (Dr. Micks) could not recommend such drastic treatment.

Dr. J. O'CONNOR mentioned two cases of pneumococcal empyema in children which had recently been under his care, and which had cleared up by repeated aspirations, and said that he thought aspirations were well worth trying in children.

Dr. BEWLEY, in reply, said he had no doubt that in some cases postural drainage was very efficacious. Sometimes it was very difficult to decide where the gas in an empyema came from. In the case he had described the sputum was purulent, but not foul-smelling. He thought that if improvement did not take place after postural drainage, all cases should be operated on, or repeatedly aspirated. He agreed with Dr. Freeman that a streptococcal empyema should not be operated on too early. If operation was done before the adhesions were firm, there was the possibility that a localised empyema would turn into a generalised empyema, and the result was very likely to be fatal.

Dr. R. T. JACKSON (with Dr. E. J. WATSON) showed a case of Transposition of the Viscera with Congenital Heart Disease, and Dr. R. H. MICKS showed a case of muscular dystrophy with hypotonia.

EFFECT OF WEARING HIGH HEELS.—In the report last week of the Section of Orthopædics (p. 1297, col. 2, par. 2, line 26) for "the pain they felt" read "the *pressure* they felt" when first putting on the shoes each day. There is, Mr. Roth says, no question of pain at all, and the feeling of pressure passes off in a few moments.

In the same report the remarks made by Miss E. H. Jebens were erroneously attributed to Miss M. S. Jevons.

REVIEWS AND NOTICES OF BOOKS

A Manual of Midwifery.

Seventh edition. By THOMAS WATTS EDEN, M.D., C.M. Edin., F.R.C.P. Lond., F.R.C.S. Edin., F.C.O.G., President, Royal Society of Medicine; Consulting Obstetric Physician to Charing Cross Hospital and Queen Charlotte's Hospital; and EARDLEY HOLLAND, M.D., B.S. Lond., F.R.C.P. Lond., F.R.C.S. Eng., F.C.O.G., Obstetric and Gynæcological Surgeon to the London Hospital; Consulting Surgeon, City of London Maternity Hospital. London: J. and A. Churchill. 1931. Pp. 728. 21*s*.

THE appearance of a new edition of Eden and Holland's Manual of Midwifery is an important event in British obstetrics. The last edition, we are informed, was sold out more than a year ago and would-be purchasers have lately found second-hand copies scarce and often at a premium. The revision in this as in the last edition was in the capable hands of Mr. Eardley Holland. Several sections have been rewritten and some new plates and illustrations have been added, but the text has been enlarged only by some 40 pages.

As would be expected after the lapse of six years, the sections on the ovarian hormones and on the physiology of the menstrual cycle have called for substantial alterations. In the account of the development of the placenta and embedding of the ovum full consideration has been given to the description by the late Prof. J. H. Teacher of the embedding of the Bryce Teacher No. 2 ovum. In the section on hyperemesis the indications for ending the pregnancy are well given, but more guidance might have been afforded regarding the choice of operation. Vaginal hysterotomy or rapid dilatation of the cervix after insertion of a tent, followed by digital or instrumental evacuation, are the alternatives advised. Both these operations lead to shock and loss of blood, largely uncontrollable, and in our opinion abdominal hysterotomy is far preferable after the twelfth week. The paragraph on diagnosis of pyelitis is misleading. Recent work on the bacteriology of the urine in normal pregnancy and its bearing on diagnosis of inflammation of the urinary tract are ignored. It has been shown repeatedly, for example, that the urine in 30 per cent. of normal pregnant women contains *B. coli* on culture, that the presence of coliform bacilli on culture cannot therefore be considered diagnostic of pyelitis, and that the only reliable method is the microscopic examination of the single uncentrifuged unstained

dlrop. As to treatment, the undoubted value of postural treatment and the claims of the indwelling ureteral catheter, according to the method advocated by J. O. Russ, before resort to induction of premature labour, might have been mentioned.

The section on toxæmias of pregnancy has been largely rewritten. The American term "pre-eclampsia" is adopted instead of the time-honoured name "albuminuria of pregnancy." For this change there is much to be said, especially as it tends to impress on the mind of the clinician the risk that these cases may end in convulsions (though it may be doubted whether this is really the most serious danger); but the student is likely to be confused by the distinction between "pre-eclamptic" used in this sense, and the "pre-eclamptic state" which do not mean quite the same thing. The risk of the subsequent development of chronic nephritis is sufficiently emphasised, though some credit might have been given to the work of J. M. Slemons (1913) and of John W. Harris (1924).

The section on placenta prævia is excellent; the method of treatment by continuous weight traction on the fœtal head by Willett forceps is described and recommended. In the conduct of normal labour stress is laid on the influence of droplet infection and on the importance of simple measures to prevent it. There is a useful section on analgesics and anæsthetics in normal labour and the advantages and disadvantages of scopolo-morphine narcosis are clearly set out. The paragraphs on the action and uses of ergot might well have been expanded and some guidance included as to the preparations of ergot that are really effective. The section on the new-born child has been revised and rewritten by Dr. K. H. Tallerman; we are glad to note that he is an advocate of four-hourly feeding for most healthy infants.

A new and most useful introduction is the "Guide to Further Reading" placed at the end of each one of the nine parts into which the book is divided. There are very few printer's errors. The name of Miss Sym is misspelt on pages 119, 120, and 125. "Anterior hysterotomy" on page 631 should read "abdominal hysterotomy." The edition maintains the high standard of its predecessors and is a sound, thoughtful, well-written, and up-to-date exposition of the subject.

Colloids.

By ERNEST S. HEDGES, M.Sc., Ph.D., D.Sc., A.I.C., late Darbyshire Fellow of the University of Manchester. London: Edward Arnold and Co. Pp. 272. 12*s.* 6*d.*

ALTHOUGH the colloidal state of matter is as widespread and as important as any of the other states, our knowledge is still so small that a short textbook need not omit any important points of general interest. The rapid growth of the subject, however, must have made Dr. Hedges' task difficult. He has carried it out with great success. Too often, writers serve only to emphasise the unsatisfactory state of our knowledge, each apparent advance being cancelled out by a contradiction, and the reader is left with the feeling that it is idle to bother about the subject until more is known. Dr. Hedges, however, emphasises the significant advances, and leaves each subject in a spirit of optimism. Seldom has the reader who is not working on colloids, but needs to be familiar with their principles and properties, been so kindly treated. Although work published as recently as 1930 is included, the importance of the latest advances has been fairly assessed; thus thixotropy is regarded as being as significant a phenomenon of gels as imbibition and syneresis.

The author states that he has approached the subject "by getting down to the colloidal particle itself in imagination," thus obtaining a better mental image of the processes involved, than by regarding the colloidal system as the unit. Presumably some such mental feat is necessarily performed by all discriminating writers on the colloidal state: where Dr. Hedges's treatment is distinctive and valuable is in the emphasis he lays on solvation as a factor in the stability of the colloidal particle. The most stable colloids are those which are apparently the most heavily solvated; and dehydration of the particles of a hydrophilic colloid transforms it into a sol having the typical properties of a hydrophobic colloid. For its coagulation, discharge and dehydration must occur. Of solvation effects in lyophobic colloids less is known, but it is suggested that the purely electrical treatment of their stability is inadequate. The idea of solvation is also ingeniously used to explain the Hofmeister or lyotropic series, which, it is suggested, "expresses the order in which the ions take up water or affect the degree of association of water"; for the taking up of "available" water effects the dehydration of colloids, and the disturbance of the water equilibrium affects the physical properties of liquid water, in the alteration of which by salts the Hofmeister series is also encountered.

Dr. Hedges resists classification as far as possible; colloids form an admirable example of a gradation from one extreme type to another with several anomalies en route. One needs a conception rather than a definition of the lyophile and lyophobe types—to use perhaps the most significant pair of names out of the many pairs that have been suggested, for it would appear that solvation is a very important factor causing the transition from the one type to the other.

The chapters which will be read with greatest interest are those on reactions in gels and on periodic reactions, on which subjects the author has himself done much work. Although Dr. Hedges is still unable to give an explanation of the Liesegang phenomenon of general applicability, his production of periodic structures in simplified systems and finally by diffusion of hydrochloric acid into pure sodium chloride solutions, enables him to state that "the condition for periodicity appears to be the existence of some critical condition determining a change" (precipitation or coagulation) "which proceeds to completeness once the critical value is reached." Regarding banded structures occurring in biology, he utters a warning against a too eager ascribing of these to the Liesegang effect, because organisms are subjected to so many periodic influences from their environment.

Operative Dental Surgery.

Third edition. By J. B. PARFITT, L.R.C.P., M.R.C.S., L.D.S., Consulting Dental Surgeon and late Lecturer on Operative Dental Surgery at the Dental School of Guy's Hospital. London; Edward Arnold and Co. 1931. Pp. 405. 21*s.*

WHEN this book first appeared ten years ago it was speedily recognised as a valuable and original contribution to the practice of dental surgery. It was lucid, concise, and practical, and it was obvious that the

author wrote from experience. Each method of treatment praised by Mr. Parfitt had evidently been used by him personally with success. This edition has been considerably enlarged and extensively rewritten, and covers the whole field of operative dental surgery. While the book contains many ingenious devices for attaining a better standard of technique, mechanical methods are not over-elaborated at the expense of sound surgical principles. Mr. Parfitt does not content himself with formulating standards of practice which are not attainable under the conditions in which dentistry has to be performed. For example, in the chapter on Infection and Cleanliness, a nice sense of proportion discriminates between what is ideal and what is really practicable. Asepsis in the true surgical sense is impossible in most dental operations but the technique described here certainly eliminates serious dangers, and its adoption is not beyond the powers of the average dentist working under average conditions. One of the best chapters is that on pulpless teeth and their treatment. The author's evident delight in methods of conserving teeth does not blind him to the dangers arising from septic ones. He does not advocate the ruthless elimination of all pulpless teeth, and gives good reasons for their retention under proper conditions. But he realises that a heavy responsibility lies on the dentist who undertakes the treatment of a pulpless tooth, and he has planned a sequence of treatment, logically thought out, which undoubtedly gives a good chance of permanent success.

Every dental practitioner should read this book for the common sense which is evident on every page and for the wealth of practical detail supplied.

Die Bakteriologie der Wurmfortsatzentzündung

und der Appendikularen Peritonitis. By W. LOHR and L. RASSFELD. Leipzig: Georg Thieme. 1931. Pp. 96. RM.12.

THIS is an account of an investigation of that very difficult problem, the bacteriology of normal and diseased appendices, together with an attempt to assess the ætiological significance of the different organisms found. It has been a most laborious undertaking and, although it has not produced results on which dogmatic views could be based, they are of great value, and should be studied by all interested in the ætiology of appendicitis.

The Vitamins.

Monograph of the Pickett-Thomson Research Laboratory. Vol. I. By ETHEL BROWNING, M.D. Liverp., Assistant Pathologist to Pickett-Thomson Research Laboratory, St. Paul's Hospital, London. London: Baillière, Tindall and Cox. 1931. Pp. xxxii. + 575. 42*s*.

Dr. Ethel Browning has attempted to deal with the literature of the vitamins in one of the recognised ways, by collecting and collating 3000 scientific papers. Books of this type are useful as bibliographies or books of reference, but they have the disadvantage that they are out of date almost before they are printed. Examination of some of the chapters produces some lack of confidence that the treatment of the various parts of the subject will bear due relation to their relative importance, or that the historical development of certain of the chains of research has been properly understood by the author. In the account of the differentiation of vitamins A and D, for instance, a chain of research which makes a fascinating story if clearly and logically set out, but as several of the key experiments are omitted and others are misunderstood, the logical cohesion of the whole is destroyed. It is evident that the writer is not really familiar with the ramification of the subject; under the heading Quantitative Estimation of Vitamin A the statement is made "In England the biological test is regarded as unsatisfactory, compared with chemical tests, where such can be instituted." Though literally true of England or any other country, this is a most misleading statement, when left to stand by itself, and it in no way represents the consensus of opinion among workers on the estimation of vitamin A, in this or any other country.

The book, though it is unsatisfactory in some ways, has value as a general bibliography. It would be easier to use if it dealt with each of the vitamins separately, rather than with odd information about all the vitamins under half a dozen different headings.

Wissenschaftliche Abhandlungen.

By EWALD HERING, late Professor of Physiology in Leipzig. Published by the Saxon Academy of Science in Leipzig. In two volumes. Leipzig: Georg Thieme. 1931. M. 57.

Ewald Hering was born in 1834, took his doctor's degree at Leipzig in 1860, and became professor of physiology first at Vienna, then at Prague, and finally at Leipzig, where he died in 1918. These two bulky volumes, which contain a reprint of nearly all his writings published in various scientific journals, are a tribute to his memory, prepared in response to the often expressed desire of his former pupils and colleagues. The earlier papers deal with various zoological, anatomical, and physiological subjects, but more than three-quarters of the whole collection concerns the physiology of vision, more especially the theory of binocular vision, the light sense, and the theory of colour vision. It is chiefly in connexion with the last subject that Hering's name is familiar to English readers, and though his theory of three substances in the retina, the metabolism of which in response to different light stimuli is supposed to account for all the phenomena of colour vision, does not now find general favour, the most authoritative writers still admit that much of the material to be found in his detailed work in support of this theory is of permanent value. The publication of these volumes removes every excuse save one for ignoring the work of one of the chief protagonists in the debate. The one excuse is that there is unfortunately no index.

From the table of contents it will be seen that no less than 85 separate works are contained in these volumes. Some of them are comparatively short, but one runs to 358 pages, being made up of five separate articles reprinted from the Beiträge zur Physiologie. The total number of pages (which are reproduced in facsimile from the journals in which they originally appeared) must be not less than 2000. The earliest reprint in the collection is dated 1856. From 1860 till 1900 Hering's output of articles was about an average of two per year. The latest paper in the collection is dated 1915 on the Phenomenon of Purkinje in the Central Area of the Field of Vision.

THE LANCET.

LONDON: SATURDAY, DECEMBER 19, 1931.

PLEURAL SHOCK.

PLEURAL puncture should never be undertaken light-heartedly for it is never devoid of risk. The physician who proposes to explore the pleural cavity, to aspirate fluid or to inject air, should remember that he is performing a delicate operation. Inadequate local anæsthesia or the use of blunt, coarse or old needles will cause unnecessary suffering to the patient, while any neglect of surgical cleanliness may result in pleural sepsis and lead to disaster. The occurrence of syncope may call for the immediate exhibition of stimulants and if these are not at hand the patient's life may be threatened. It is necessary to insist upon the need for these elementary precautions because familiarity breeds contempt and the practice of artificial pneumothorax, with the frequent pleural punctures it entails, is apt to blunt the mind to the need for constant care and vigilance until, perhaps, a wholly unanticipated tragedy teaches a lesson that cannot be forgotten.

Any interference with the pleura, whether in connexion with major or minor operations, the dressing of wounds of the chest, or pleural lavage, may cause pleural shock. This may also occur when an artificial pneumothorax is induced, or complicate any subsequent refills. It may be expressed by a transient faintness or give rise to alarming symptoms. In a typical case, at the moment of pleural puncture, or perhaps after a short interval, the patient suddenly passes into a state of collapse. He complains of a feeling of constriction in the throat or of threatened suffocation, and there may be severe pain in the chest. The face is pallid, or ashen grey, or more definitely cyanosed and bedewed with sweat. The pulse is weak or may be scarcely palpable, and unconsciousness may supervene. Under the influence of stimulants recovery usually takes place, the patient is none the worse for his experience, and subsequent punctures are as a rule uneventful.

The cause of pleural shock is unknown, and though various theories have been suggested, none is wholly convincing. When air embolism occurs its cause is usually obvious. Puncture of a pulmonary vein renders possible the injection or aspiration of air into the blood stream as it passes towards the left auricle; even a minute bubble of air reaching the cerebral cortex by way of the carotid and internal maxillary arteries will result in air-apoplexy with which syncope, paralysis, or visual disturbances may be associated. But pleural shock may be seen when a needle has penetrated a pneumothorax cavity which is free from adhesions, or when, as in a case described by Dr. C. H. COCKE,[1] the parietal pleura has been pricked but not penetrated. His colleague Dr. JONATHAN MEAKINS of Montreal, discussing the question from the physiological standpoint, suggests that the phenomena of pleural shock may be due to vascular spasm. He has observed that puncture of an artery—e.g., the brachial or radial—may be followed by similar symptoms—pallor, cyanosis, dyspnœa, palpitation, slow and powerful heart action, nausea, syncope, and sometimes unconsciousness. He considers that despite the usually accepted theories, the pulmonary circulation is under nervous control, though it may not react pari passu with the systemic circulation to any given stimulus. If this is so, reflex action between an over-sensitive pleura and the pulmonary circulation may in certain conditions cause vascular spasm of the finer pulmonary vessels, embarrass the thoracic circulation and, by decreasing the volume of the blood-supply to the left side of the heart, produce cerebral anæmia. Syncope, respiratory distress, unconsciousness, or even pulmonary œdema would be the clinical manifestations of such a disturbance, and it is possible that pleural shock may be accounted for in this way.

[1] Amer. Rev. Tuberc., November, 1931, p. 543.

THE DOCTOR AS NATURALIST.

IN the last number of *Guy's Hospital Reports* (1931, vol. lxxxi., p. 278) Dr. J. A. RYLE prints an interesting discourse on the physician as a naturalist, in which he suggests that the doctor will be likely to reach the most just view of diseases if he will regard them with the same detached affection which the naturalist devotes to the objects which happen to be of interest to him. Much the same standpoint is taken by Dr. A. E. COHN in his recent book "Medicine, Science, and Art"[1] in which he argues even that a passion for knowing about diseases may with advantage sometimes be divorced from any design to prevent or cure them. The naturalist certainly has no ulterior motives; what he wants is to be as familiar with his birds or beetles or slugs as he may be, to know all about them, how they live, what they eat, and how they behave. He is in short, fond of them and is by no means necessarily an economic zoologist whose main purpose is to keep them in order. However this may be there is no doubt that the great physician has often been a naturalist as well: OSLER's first paper was on pond life, BRIGHT started as a zoologist, and so did WHARTON JONES, and there are plenty of contemporary examples; Sir THOMAS LEWIS is an authority on birds as well as hearts.

Of this sort of physician there has been no more conspicuous example than EDWARD JENNER (1749–1823), of whose life and doings Dr. DREWITT has now given us a brief but really adequate account.[2] JENNER found out the strange habits of the cuckoo, and he discovered vaccination, and it would be balancing incomparables to attempt to discuss in which he was greatest. Partly on his own

[1] See THE LANCET, Oct. 10th, 1931, p. 810.

[2] The Life of Edward Jenner, M.D., F.R.S. By F. Dawtrey Drewitt, M.D., F.R.C.P. London: Longmans Green and Co. 1931. Pp. 127. 6s.

initiative and partly at the instigation of JOHN HUNTER, his teacher and friend, he was constantly trying to explain what he found around him in the country, as is well shown in the intermittent diary (1787–1806) which came into the possession of the Royal College of Physicians of London in 1888, and has now so properly been brought to light by the Harveian librarian.[3] JENNER studied hibernation in hedgehogs, marked fledgling swifts by clipping their toes, and found that the identical birds came back to the same place next year, made a mistake in thinking that the flowers of the evening primrose shut up during the day to conserve their nectar against their opening again at night, dissected anything he got the chance of looking at, thought that the hydatids he found in various animals were allied to the pimples which "I have often seen thinly dispersed over the face and neck of my son Edward," and also to tuberculosis, saw the importance of earthworms in stirring up the surface of the soil. He was sometimes right and sometimes wrong, and always curious and sincere. We wonder if he knew J. L. KNAPP, who lived in his neighbourhood and published "The Journal of a Naturalist" in 1829; they would have had much in common. And all of a part with this absorption in nature, he was a good doctor. He went to Gloucester to operate at the infirmary, was nearly frozen on a ride into the hills to see a patient, and stored the remark of the dairymaid at Chipping Sodbury in the back of his mind until he had a chance to try whether it was true. As a world-famous man he was not as happy as when he was hunting out cuckoos and hedgehogs; he came into a controversial world and it tired and bothered him—probably inevitably: the disinterestedness of the naturalist does not always prevail in professional circles, and as he writes in his last years "I boast of my strength in the morning, but evening comes before its time."

AN ASSESSMENT OF SANOCRYSIN.

SANOCRYSIN has now been in use as a remedy against tuberculosis for seven years. Those who saw in it a specific have been disappointed; those who prophesied that in five years' time it would be relegated to the long list of discarded remedies have also proved to be wrong. Like tuberculin it has not fulfilled all that was hoped, but like tuberculin it still holds a useful place and will not be denied. Moreover sanocrysin has saved intravenous chemotherapy from utter disrepute in tuberculosis since it is the only one of a host of antiseptics and metallic salts (there is a possible exception for krysolgan, another salt of gold) which has survived the early wave of enthusiasm. The amount in grammes of sanocrysin used each year since 1927 at a large tuberculosis hospital has been 152, 264, 83, 75, and (this year up to November) 120.

What then are the grounds for the continued use of sanocrysin? The early claim that it would destroy the tubercle bacillus in the tissues has not been sustained. It is the old story; the bacillus is more resistant than the cell. Similarly the claim that the tubercle bacillus in the blood stream might be thus destroyed has also broken down. At first it was thought that the presence of connective tissue in the chronic fibrotic lesion prevented the sanocrysin from reaching the bacillus; then it became clear that this was not so. Acute miliary tuberculosis is unaffected by sanocrysin, which has failed too in bone and joint cases and in lupus. How it acts is not yet clear but there is reason to suppose that a cellular response is induced in the tissues, inimical to the activity of the tubercle bacillus. Dr. V. STUB-CHRISTENSEN suggests[1] that it may act partly by stimulation of the reticulo-endothelial system, so that the bacilli are subjected to rapid phagocytosis, partly by stimulating the formation of new connective tissue. Nearly all observers are agreed that one of the earliest signs of improvement in sanocrysin treatment is the disappearance of tubercle bacilli from the sputum, and it seems unlikely that a few small injections could destroy all the bacilli although they might stimulate cellular response. When first introduced the dosage of sanocrysin was large; in the light of present experience we should almost call it massive. The initial dose ranged from 0·25 to 0·5 g. and was followed by doses of 1 g. at an interval of three to five days up to a total amount given of 9–10 g. In a paper which we publish in our present issue, Dr. KNUD SECHER, one of MØLLGAARD'S original collaborators, still advocates the large dose and states that in his opinion many of the poor results are due to faulty, usually too low, dosage. In the following paper Dr. ALLON PASK says he has discontinued doses larger than 0·75 g., a patient being considered to have had a complete course when he has received 5 to 6·5 g. over a period of 12 or more weeks. It is difficult to compare results obtained by different principles of dosage. Dr. PASK notes the rapid disappearance of tubercle bacilli from the sputum, definite improvement in X ray signs, and retardation of the sedimentation-rate. Replies to a questionaire circulated[2] amongst French physicians include the views of such well-known tuberculosis workers as Dr. P. F. ARMAND-DELILLE, Dr. F. BORDET, and Prof. LÉON BERNARD; the consensus appears to be that sanocrysin is definitely useful but must be employed with care and in small doses. Dr. STUB-CHRISTENSEN (already quoted) deals with 438 cases treated at the Silkeborg Sanatorium since the introduction of the drug; 384 of which were given sanocrysin as the only adjuvant. A series of 152 cases treated in the early days of large doses were less successful than 232 cases treated later with small doses, both in respect of disappearance of bacilli from the sputum and of the percentage fit for work during the five years following discharge. He agrees with other workers in advocating sanocrysin as a subsidiary treatment in collapse therapy. In

[3] The Note-Book of Edward Jenner. Edited by A. C., with an introduction by F. D. Drewitt. London: Humphrey Milford, Oxford University Press. 1931. Pp. 49. 3s. 6d.

[1] Tubercle, 1931, xiii., 49.
[2] Vie Médicale, Nov. 25th, p. 1905.

this country good results are recorded [3] by Prof. S. LYLE CUMMINS, and Dr. B. R. CLARKE, the latter having reviewed [4] his cases after a prolonged interval.

On the other side of the picture may be quoted a recent investigation in America [5] of 24 cases chosen as exceptionally good subjects for the treatment on the basis of clinical, radiological, and laboratory findings. These cases were then divided into two comparable groups of 12 each, the cases being as far as possible matched one with another. One half was given sanocrysin and the other half used as controls, the choice being decided by the toss of a coin. Each patient was studied independently by two of the workers and given a rest of 30 days in bed to eliminate variable factors before treatment was begun. The sanocrysin cases were given total amounts varying from 3·1 to 6·1 g. The controls were given parallel injections of distilled water, and the patients themselves were not aware of any distinction in treatment. The authors could discover no evidence of the beneficial effect of sanocrysin on pulmonary tuberculosis or its complications, and they think it was at least partly responsible by virtue of its inherent toxicity for the unfavourable trend of the disease in some cases. Turning to experimental evidence it may be recalled that CUMMINS obtained successful results in rabbits, as did also MADSEN and MÖRCH, who however failed to repeat these good results later in a parallel series with BAUG. Dr. E. E. ATKIN has recently supplemented [6] his work and shown that sanocrysin has an inhibitory reaction on tuberculous lesions in rabbits. His work suggests that sanocrysin exerts an inhibitory effect on these lesions quite apart from any bactericidal action it may have on the living tubercle bacillus.

We are by no means at the end of the chapter. Clinical records do not have the finality of a test-tube experiment, but the fact that sanocrysin is still in daily use in many institutions after a trial of five years and upwards is evidence that its advocates have reason for believing in it. Far more careful comparison with controls is necessary in assessing the value of such treatment which cannot be used blindly as a routine measure. Sanocrysin needs careful handling, for it is prone to give rise to various unpleasant and even serious accidents.

[3] Tubercle, 1926, vii., 486. [4] Ibid., 1927, viii., 465.
[5] Amberson, J. Burns, Jr., McMahon, B. T., and Pinner, Max: Amer. Rev. Tuberculosis, 1931, xxiv., 401.

[6] Brit. Jour. Exper. Path., August, 1931, p. 249.

ANNOTATIONS

CHRISTMAS AND THE R.M.B.F.

WE feel bound to make a final appeal before Christmas for the organisation which tries to relieve the distress that often falls on members of our profession and their dependents. The brief case-notes published from time to time by the Royal Medical Benevolent Fund are so painful that most people avoid looking at them. They are painful for two reasons: first, because it is shocking to read of the straits into which our colleagues and their children have fallen, often despite the most courageous struggle against illness and adversity; secondly, because the sums which the Fund is able to spare them seem pathetically inadequate. This is not the moment perhaps to inquire how this so-called charity can be provided with a sufficient regular income. But at a time when poverty is increasing and ordinary support is bound to decline, we venture to ask for a special effort in favour of those who are unable to bear more hardship and whose claim on us all is great. "There, but for the grace of God, goes John Bradford" is a sentiment which each can echo as he hears of other medical men who have been unlucky or unwise, and whose misfortune or error has descended upon their children. Maintenance is the first essential and the real problem is how to give that help which is needed constantly throughout each year. At the same time in a season when mild self-indulgence is still the rule we may perhaps hope for generous response to Sir Thomas Barlow's appeal that none of those in the care of his committee shall "look in vain this Christmas for the gift which can bring a few additional necessities of life and extra comfort to their homes." He says that cheques, postal orders, or even stamps should be addressed to the hon. treasurer of the Fund at 11, Chandos-street, London, W.1.

A TREATMENT FOR BALDNESS.

IF the surprising results recorded by B. N. Bengtson [1] are confirmed they may mark a notable advance in the treatment of baldness. Of the 16 cases dealt with in his preliminary report, 9 are stated definitely to have been cases of alopecia areata, of duration varying from 6 months to 23 years. The seven remaining cases included two associated with Fröhlich's syndrome, which first impelled Bengtson to test the effect of pituitary injections; in one of the other cases the baldness followed trauma; in another it was due to luetic or associated luetic infection, and finally there were two described as universal alopecia, of 16 and 23 years' duration respectively. Of the 16 patients, 11 were males and 5 females. While the ætiology of alopecia areata and the control of hair growth awaits elucidation, there is an increasing agreement that there is an important endocrine factor and a more or less intimate relation to the sex glands, as suggested by the development of hair at puberty, and (as pointed out by Sabouraud long ago) the rareness of baldness in the eunuch. Fröhlich's disease includes dystrophy and loss of the hair, and its effective treatment by pituitary injections encourages the belief that the pituitary gland has an important influence over the growth of the hair. Bengtson's scheme is to give 1 c.cm. of anterior lobe extract hypodermically, at first once a week, then twice, and then three times. Simultaneously 0·5 c.cm. of the same extract was given on five or six days a week. Posterior lobe extract was given hypodermically in six cases, and thyroid

[1] Jour. Amer. Med. Assoc., 1931, xcvii., 1355.

in one case which did not respond to pituitary alone. The results recorded indicate that in all the 16 cases there was a gratifying response to the treatment. They are graded as follows: excellent (11), good (4), and fair (1). Two photographs illustrate the effects in alopecia areata, and one shows striking benefit in a man of 58 labelled senility and alopecia. The number of injections required to provoke growth of hair of normal colour and texture varied between 78 and 220. Bengtson points out that the types of baldness treated fall into the category of glandular alopecias, and he does not commit himself about the common type of senile or presenile hair loss, although he has recently begun treatment of such cases on the same lines, and reports "regrowth of lanugo hair and hair in four weeks on daily injections," in a case with the typical shiny crown and forehead since 1914. Every dermatologist will agree with him in his concluding sentence that "enthusiasm at this time is not warranted, and continued observations should be made until the merit or failure of this treatment is decided." Caution should be exercised furthermore in the matter of dosage. Half a gramme of pituitary substance is a considerable dose, and on pharmacological grounds it would perhaps be wise to begin treatment with a smaller amount.

In a subsequent letter to the same journal (Nov. 28th) Bengtson says that he has received several thousand letters about his method, and is unable to answer them. "The experiments," he adds, "while gratifying in certain types of baldness, do not indicate that a complete solution of this age-old problem has been realised."

THE CRIPPLED CHILD.

THE problem of the crippled child in our country resolves itself into ascertainment of the incidence of crippling among children, the possibility of preventing its causes and circumstances, effective treatment, after-care, and the education of the child in body and mind. The Chief Medical Officer of the Board of Education, in his report on the health of the school-child for 1930,[1] groups the causes and conditions of crippling under five main heads. These are: (1) congenital defects and birth injuries; (2) nutritional disorders; (3) acute infectious diseases affecting the neuromuscular mechanism; (4) constitutional diseases affecting the bones and joints; and (5) accidents. He points out that prevention is a term that can be used in two senses: that of averting the crippling disease, and that of preventing deformity once the disease is established. The primary aim of an orthopædic scheme is therefore to discover the cripple at the earliest possible moment and to follow him up by efficient and prolonged treatment at a hospital or clinic. It must also include after-care, vocational training, and an interest in securing and maintaining the employment of the subject. The scheme involves first concentration on certain diseases, for example, tuberculosis, one of the principal single causes of crippling. Much is being done to prevent infection of children from human sources, while their protection from bovine sources depends on the production and supply of tubercle-free milk. Surgical tuberculosis is now treated conservatively by immobilisation under open-air conditions, and the outlook for these patients is altogether brighter than it was 30 years ago, when the treatment was radical operation. Prevention of crippling in the third group is a difficult problem. No certain means are known at present of directly averting poliomyelitis, but treatment by convalescent serum has given encouraging results. Prompt diagnosis is of the utmost importance, both for serum treatment and for the prevention of deformity. Improved midwifery should do much to prevent birth injuries, and early treatment can prevent a great deal of congenital deformity.

Alongside diagnosis and treatment there is the need for education, and modified elementary school training is provided in all orthopædic institutions. For the younger children there are story-telling, descriptions of pictures and talks on nature study; simple manual education such as paper-folding, clay-work, drawing and colouring; singing, breathing exercises, and music. The older children follow the public school curriculum, but usually need individual attention, as they are backward from loss of school time, and also because they will probably have to earn their living later by some special occupation for which training can begin early. Beyond the school age there must also be training centres to teach special suitable trades under orthopædic supervision. Finally, there is the need for re-education of the crippled body and the restoration of the inherent powers of repair—to be achieved by skilled passive movement, massage, and exercise.

The organisation provided by the Board of Education is, in the opinion of its chief medical officer, fulfilling its objects. The net of ascertainment is becoming both wider and finer. The report gives tables showing the gradual increase in the numbers of ascertained cases and in the number of orthopædic schemes made by local authorities. The number of crippled persons attending vocational courses has steadily increased, from 56 in 1920–21 to 241 in 1929–30. During the past six years 131 new schemes have been approved, bringing the total in England and Wales to 216 schemes. It is becoming less and less common to find serious deformity; where schemes have been in progress for some time the cripples are dealt with earlier, and gross deformities are overcome or prevented. The orthopædic organisation is definitely mending cripples and returning them to the ranks of normal school-children or normal employment. In Leeds 75 per cent. of the cripples have been returned to school, and other centres show similar figures. Moreover, the work being done for cripples is reducing such diseases as tuberculosis and rickets. Tuberculosis is a diminishing disease, but the death-rate for non-pulmonary tuberculosis has declined more rapidly than that from phthisis; for children of school age it has been practically halved in 20 years. A factor in this remarkable saving of life has undoubtedly been the wide extension of schemes for cripples. The chief medical officer boldly claims that English enterprise on behalf of the medical and surgical healing of the cripple is one of the best examples of the application of the principles of preventive medicine that can be found. "It is truly economical and truly constructive," he says. "It is saving time, money, and life; it is the building-up of capable men and women from the gravest of disabilities and impairments; it is the reconstruction and restoration of that which has been so nearly destroyed; it is putting into practice the real principles of preventive medicine. Secondly, it is the design of those principles in their true sequence—ascertainment, healing, prevention. And lastly, it illustrates almost perfectly the close co5peration of municipal and voluntary service."

[1] H.M. Stationery Office. 1931. Pp. 125. 2s.

CONVICTION OF DRUG SMUGGLERS.

EARLY this year we called attention [1] to drug addiction in Egypt, and to the startling disclosures made by T. W. Russell Pasha of the international gang of smugglers who were largely responsible for the vast illicit traffic which has been neutralising the efforts of the League of Nations to confine the use of narcotic drugs to medical and scientific purposes. The efforts to unmask this gang were crowned with success on Nov. 29th when judgment was given at Basle against six persons of different nationalities who were convicted of wholesale smuggling of heroin and other drugs. Their operations had been traced from Switzerland to Cairo, Tokyo, Buenos Aires, and other places, and the consignments had been declared as consisting of powdered glue or labelled "milk product for infants." Dr. Fritz Müller, a German residing in Basle, was sentenced to nine months' imprisonment and a fine of 20,000 Swiss francs; Dr. Rausch, a chemist of Geneva, to four months' imprisonment and a fine of 10,000 Swiss francs; Dr. Diepenhorst, a German, failed to appear, and forfeited his bail of 3000 francs; while a fourth trafficker named Balinari was sentenced to six weeks' imprisonment and fined 1000 Swiss francs. Others implicated in the same nefarious traffic are still at large pending extradition proceedings which have been initiated. Salutary as has been the sequel to the prolonged international efforts of the police, it is, to say the least, doubtful whether the punishments fit the crime, in view of the gigantic profits which must have accrued to those engaged in this heartless trade. For years Switzerland refrained from ratifying the Hague Opium Convention of 1912, and its dangerous drug regulations appear to be less stringent than the Acts of 1920 to 1925 passed in this country. Under these a penalty may be inflicted of penal servitude up to ten years in addition to a fine of £1000. One charge alone against the Basle prisoners consisted in a sale of 12 cwt. of heroin valued at £14,500.

UNDULANT FEVER AND INFECTED MILK.

BRUCELLA infection is one of the most widespread contagious diseases of cattle in Great Britain, and cases of undulant fever in man are steadily being reported. Most of these are single cases, and their ætiological connexion with a specifically infected milk-supply has rarely been demonstrated. An account [2] of an outbreak of undulant fever traced to an infected milk-supply is therefore of interest. The six cases were all in the small town of Pitman (population 5387), 18 miles from Philadelphia, U.S.A., and the onsets were between Sept. 1st, 1930, and Nov. 23rd, 1930, except in one case in which the date could not be accurately determined. The patients were three of each sex and with ages from 17 to 58 years. The first case was only recognised on Nov. 25th, the diagnosis being based on clinical symptoms and specific agglutination of the blood. The report gives particulars of a careful investigation of all possible sources of infection, and except for milk no connexion was traceable. The daily milk consumption of the town at the time of the cases was about 2056 quarts, of which 75 per cent. was pasteurised and 25 per cent. sold raw. There were eight dealers, and of these Dealer A supplied 17 per cent. of the town's total milk and 69 per cent. of the town's raw milk. He did not pasteurise his milk. All the cases used raw milk from Dealer A. Of his supply about 300 quarts were from his own herd, while the other 150 quarts was purchased from another dairyman. About Dec. 12th the agglutination test was applied to each animal of the herd, and 24 out of 42 gave positive reactions. Fourteen gave positive reactions with the milk serum. *Brucella melitensis* var. *abortus* was isolated from the milk of two out of six cows. The transportation and sale of all raw milk or dairy products was prohibited until all reacting animals were permanently removed unless the milk and milk products were first pasteurised. The supply was pasteurised, and no fresh cases developed, although customers (after a brief discontinuance) had sufficient confidence to continue the use of this milk.

C. W. Dalrymple-Champneys, in his valuable report [3] on undulant fever, states that the proportion of English milk which contains *Br. abortus* is not known, but in an examination of 488 samples taken from the milk-supply (unpasteurised) of a large town, it was found that 5·7 per cent. of "single" milks and 8·8 per cent. of "mixed" milks contained the organism. He further adds that apparently only 14 well-authenticated cases of infection originating in England have been reported (at the time of writing), and in only two of them was there good evidence of the source of infection, two being cow's milk and one goat's milk.

At the present time the factor which most requires elucidation is the conditions under which infection to man takes place. There is a good deal of evidence showing that cases are more likely to develop amongst those who actually handle infected material, and that infection through a specifically infected milk-supply is comparatively rare. A preliminary requirement is a more accurate ascertainment of human cases of undulant fever, with a detailed study for each case as to possible sources of infection. The above outbreak is a valuable reminder, however, that an infected milk-supply cannot be neglected as a possible source of sporadic cases or even of an epidemic of undulant fever.

THE DECOMPOSITION OF CHLOROFORM.

IT is so well known that chloroform is liable to oxidation that all pharmacopœias direct the addition of alcohol, which acts as a preservative though it does not entirely stop the decomposition. Phosgene (carbonyl chloride) is one of the products formed on oxidation and the object of adding alcohol is to convert this phosgene into hydrochloric acid and ethyl carbonate. The pharmacopœias give tests intended to detect either hydrochloric acid or phosgene itself, and these are examined by Mr. N. L. Allport in the November number of the *Analyst*. The test in most of the pharmacopœias is a mere test for hydrochloric acid, either present in the chloroform at the time of testing or formed during the test by the action of water, with which the chloroform is shaken, on any phosgene present. The water is separated from the denser chloroform and tested with silver nitrate. This test Allport found to be not very sensitive, for a slight opalescence only was given when 10 parts per million of phosgene was present in a million parts of chloroform. The test with barium hydroxide proposed by Ramsay is less satisfactory since it depends on the formation of barium carbonate, which may be formed from atmospheric carbon

[1] THE LANCET, 1931, i., 713.

[2] Hasseltine, H. E., and Knight, I. W.: U.S. Pub. Health Reports, Sept. 25th, p. 2291.

[3] Ministry of Health Rep. on Pub. Health and Med. Subjects No. 56, 1929.

dioxide dissolved in the chloroform. A test suggested by Utz, in which chloroform is treated with benzidine for 24 hours in the dark, yields a slight turbidity with about 5 parts per million, which is rather more delicate; but a general reaction given by mixtures of phenols and aldehydes with condensing agents was found by Allport to be more delicate and rapid. The reagents chosen are resorcinol and vanillin. To 15 c.cm. of medicinal chloroform contained in a dry stoppered bottle of about 25 c.cm. capacity add 20 mg. each of resorcinol and vanillin. Replace the stopper and when the reagents have dissolved, set the bottle aside in a dark place for one hour. Add 5 c.cm. of 1 per cent. aqueous ammonia solution, shake and allow the mixture to separate. When there has been prior formation of phosgene or in the presence of hydrochloric acid a pink or red colour develops in the aqueous layer, reaching its full value in about 30 seconds, its intensity varies with the quantity of impurity present. The presence of alcohol is necessary for the development of the colour, which is given strongly by as little as 1 part per million of phosgene, blank tests with pure chloroform showing no colour at all until after about two minutes when the liquid darkens by reason of the resorcinol present. The presence of even a small amount of phosgene in a drug which is used to produce anæsthesia seems very undesirable and this new test should be of value in deciding whether a sample is suitable for this purpose.

ANOTHER FIELD EXPERIMENT WITH PLASMOQUINE.

THE gametocidal action of plasmoquine has become familiar, partly as the result of experimental work done at the Institute for Medical Research, Kuala Lumpur, F.M.S., of which Dr. A. Neave Kingsbury is director. This property is especially noticeable in its action upon the gametocytes of *Plasmodium falciparum*, and to a lesser extent upon those of *P. vivax* and *P. malariæ*. There now seems good reason to believe that malaria, at all events of the subtertian variety, might be eradicated from an isolated population by regular plasmoquine dosage. How this was put to the test under working conditions in an extensive field experiment lasting one year is described by Dr. Kingsbury in a report from the Institute which has just reached us. A malarious rubber estate, having a population of about 330 labourers and dependents, was chosen for the test, and two neighbouring estates with populations of 360 and 400 were selected as controls. Parasite and spleen rates, and hæmoglobin percentages were determined on both just before the commencement of the test, and thereafter at quarterly intervals. Plasmoquine 0·04 g. was given to adults twice weekly, on Mondays and Thursdays, appropriate smaller doses to children down to 6 years of age, and to infants an emulsion of the drug from a graduated pipette. Well over 90 per cent. of the population received plasmoquine on practically every treatment day. The experiment was handicapped by the present unfortunate conditions on rubber estates, and the experimental estate was not absolutely isolated, for in the evenings there was some exchange of visits with neighbouring estates, thus making it possible for an occasional gametocyte carrier to infect anophelines in the experimental area. Nevertheless during the year among the original population the parasite rate on the experimental estate fell from 27·2 to 17·4 per cent., and the gametocyte rate for *P. falciparum* from 10·6 per cent. to nil, the spleen rate remaining fairly constant, and the hæmoglobin showing a small rise from 66 to 70 per cent. Based on the total number of labourers and dependents throughout the experimental period the parasite rate fell from 28·2 to 20·2 per cent. On the first control estate the parasite rate rose from 22·9 to 23·8 per cent. during the year, and although the spleen rate remained constant, the average hæmoglobin fell. On the second control estate, too, the parasite rate fell from 17·2 to 13·7 per cent.; the spleen rate also showed a slight fall, but the hæmoglobin remained constant. In view of all the possibilities of extraneous infection the reduction of the parasite rate within a year from 28 to 17 per cent. indicates that the plasmoquine was of definite value, though the results fall somewhat short of expectation. Only one instance of idiosyncrasy to plasmoquine was noted—an elderly male who developed gastric symptoms, combined with albuminuria, after the first dose. His spleen was greatly enlarged, and his hæmoglobin percentage was 90. After a period of treatment he was able to take plasmoquine 0·02 g. twice weekly.

INTRAMUSCULAR ADMINISTRATION OF LIVER EXTRACT AND THE RETICULOCYTE CRISIS.

DURING the last few months we have repeatedly made mention of both the theoretical and practical value of parenteral administration of liver extracts in pernicious anæmia. M. Gänssten, who was the first to use intramuscular injections extensively,[1] has now summarised his conclusions[2] from a study of 100 successfully treated cases, though unfortunately he provides no details of the blood examinations which lessens the value of the work. He gives a daily injection of extract made from 5 g. of liver, only rarely finding it necessary to increase the dose to an equivalent of 400 g. of liver, until a normal blood count is reached, usually in five to eight weeks. The injections are then reduced to once a week, with a larger dose once a fortnight. This method has obvious advantages in treating ambulant patients, and he concludes from its success that the body is capable of storing the essential principle. Relapses associated with some intercurrent infection occurred in most of the cases two to four months after cessation of treatment. A few patients were well as long as 12 months without any form of liver, but remissions of this kind were noted before the introduction of liver and cannot therefore be considered as evidence of a storage mechanism. Gänssten has had no failures, and attributes reported liver-resistant cases as due to faulty diagnosis or insufficient dosage; in this he agrees with other workers who have had an extensive experience of liver treatment. He offers no data to support the claim that intramuscular extracts are of value in secondary anæmias, especially those of gynæcological origin. His attack on the value of the reticulocyte crisis as a measure of the effectiveness of treatment does not appear justified by his own evidence. He found that there might be a rise in the reticulocyte count with no rise in the total red cell count in patients with acholuric jaundice treated with liver extracts by intramuscular injection. Since, however, the reticulocyte count may be as high as 65 per cent. in untreated cases in this condition (Dawson[3]), such observations need careful control. He also obtained a reticulocyte response

[1] Verhandl. d. Deut. Gesellsch. f. Inn. Med., 1930, xlii., 524.
[2] Deut. med. Woch., Nov. 13th, p. 1926.
[3] Brit. Med. Jour., 1931, i., 921.

in adult rats on giving tryptophane, histidine, and extracts which were ineffective in pernicious anæmia. Since the reticulocyte count in the young rat anyhow may vary between 0·3 per cent. and 6·9 per cent. (J. M. Vaughan), and he gives no figures for his normals and few for his treated rats, too great stress must not be laid on his conclusions. Indeed, G. H. Minot and C. W. Heath [4] have lately shown that the reticulocyte count can be used as a satisfactory index of the success of iron as well as liver therapy, giving a distinct type of curve, and all observers, apart from Gänssten, are in agreement as to its value in assessing the response to treatment in pernicious anæmia.

L.C.C. AND MARRIED WOMEN DOCTORS.

THE London County Council recently discussed at some length the question whether or not it should relax its standing orders in order to allow married medical women to be appointed to posts in its service, or permit single women to remain at work after marriage. The debate arose directly as a result of a resolution forwarded by the Medical Women's Federation. On behalf of the women, it was urged that dual appointments—e.g., the man being master and his wife being matron of a workhouse or residential school—were already sanctioned, and that it was a scandalous thing to put a woman in a position where the only way of retaining her work might be cohabitation without marriage. Reference was also made to the specialised experience medical women obtained in the Council's service and the loss which would be suffered by the community if they were compulsorily retired on marriage. Sir William Ray said that, apart from the impossibility of making exceptions for medical women, the position was really governed by economic circumstances and the state of unemployment in the profession. The Council, he declared, had no difficulty in recruiting adequate numbers of single women for all posts at its disposal. Mr. Cyril Jacobs, Chairman of the General Purposes Committee, said the attitude taken up by the Council was supported by many outside bodies and represented the fairest method of distribution of employment. If exceptions were made for women doctors, it would be difficult to maintain the Council's standing order in regard to other women members of the staff. The report of the committee, stating that it would be undesirable to disturb this policy, was carried by 73 votes to 42.

STANDARDISATION OF ERGOT.

SINCE the fifth British Pharmacopœia was published, in 1914, conviction has been growing that the therapeutic value of ergot is due to the specific alkaloid contained, rather than to the presence of amines, histamine, and tyramine. A special subcommittee of the Pharmacopœia Commission has been busy with the standardisation of ergot preparations, in view of the wide variation found in the alkaloidal content of ergot of rye. This committee, of which Dr. J. H. Burn is chairman, has come to the conclusion that the colorimetric method permits an accurate estimation of total alkaloid in ergot itself and in its liquid extract, even though the colour test is given equally by the physiologically active ergotoxine and the physiologically inactive ergotinine. The colorimetric method has the advantage over gravimetric methods in taking less time and less material, and biological methods of assay are subject to a considerable margin of error. Ergotoxine is regarded by the committee as the active principle for which ergot preparations are administered, and the following standards are suggested for adoption :—

Extractum Ergotæ Liquidum to contain 0·05 per cent. of total alkaloid (±0·01 per cent.).

Ergota Præparata to contain 0·10 per cent. of total alkaloid (±0·02 per cent.).

The report can be obtained for 1*s.* 6*d.* from the Secretary of the Pharmacopœia Commission, at the office of the General Medical Council, 44, Hallam-street, London, W. 1.

RIFT VALLEY FEVER.

THE enzoötic hepatitis discovered last summer in sheep, especially new-born lambs, on the shores of Lake Naivasha, Kenya, by Mr. R. Daubney and his co-workers,[1] seems not to have been quite so new as at first supposed; it appears from the evidence of Mr. R. E. Montgomery that a similar epidemic was noted nearly 20 years ago. The 1930 outbreak in the Rift Valley, however, was a severe one, for in the course of seven weeks some 3500 lambs and 1200 ewes died from acute necrosis of the liver. Attempts to transmit the disease to sheep and lambs soon demonstrated the fact that the ætiological factor was a filtrable virus; in addition to sheep, goats and cattle were found to be susceptible, whilst a natural outbreak was observed in a dairy-herd on a farm in Solai, also in the Rift Valley. The virus, preserved in oxalate-carbol-glycerin, was brought to this country by Mr. Daubney and examined by Dr. G. M. Findlay at the Wellcome Physiological Research Laboratories, Beckenham. An account of this work was given at a meeting of the Royal Society of Tropical Medicine and Hygiene on Dec. 10th, and is summarised by Dr. Findlay and Mr. Daubney on p. 1350 of this issue. The virus was still in excellent condition, for after two inoculated lambs had died within 36 hours with typical pathological changes, Major T. Dalling, M.R.C.V.S., who performed the autopsies, became acutely ill five and a half days later with rigors, fever to 103° F., headache, and pains in back, and his assistant also developed similar symptoms. Both of these illnesses were shown to be due to the virus of Rift Valley fever. Mice and rats, and a number of wild rodents were found highly susceptible to the virus both by intraperitoneal injection and through the freshly shaven skin or conjunctival sac. Rabbits, guinea-pigs, and birds are insusceptible. Monkeys although not immune do not react so readily. After a series of 56 passages through mice, it was still possible to produce the characteristics of the disease in rodents—fever, leucopenia, and focal necrosis in the liver. In man the illness resembles in many respects dengue and sandfly fever, and apart from obvious infections with the virus, it is possible to acquire immunity, as in many other diseases, without manifesting symptoms of ill-health. Dr. Findlay became immune as a result of working with the virus although he had no attack of fever. The blood changes also resemble those of dengue: an initial leucocytosis, involving chiefly the polymorphonuclears, followed by a leucopenia. After the temperature has fallen a few myelocytes may be seen in the blood film. The changes in the liver are those of focal necrosis in which may be found degenerated polymorphonuclears and hyaline degeneration of the protoplasm. Acidophilic globules are present in the livers of the sheep, goats, and some rats. Apart from its great general interest the study of this new disease

[4] Trans. Assoc. Amer. Phys., 1931, xlvi., 290.

[1] See THE LANCET, Sept. 12th, p. 601.

has a practical bearing on that of yellow fever. Though superficially similar, the two diseases are really quite distinct. Although the virus behaves in many ways outside the body as yellow fever does, yet monkeys immune to yellow fever are susceptible to Rift Valley fever, and human immune yellow fever serum does not protect mice against the virus of Rift Valley fever. Neither does dengue-immune or psittacosis-immune serum protect mice against infection.

A VIEW OF THE ANÆSTHESIA PROBLEM.

SOME criticisms that are sensible and some that seem curiously old-fashioned are contained in an article[1] on the Present Status of the Anæsthesia Problem, by Dr. A. D. Bevan, of Chicago. Dr. Bevan makes a laudable attempt to simplify the whole question of anæsthesia, and to determine, by the way in which they answer nine requirements, which he details, the respective merits of the various agents and methods. The conclusions at which he arrives are probably correct, having regard to the conditions under which he has made his trial. They will not meet with general approval elsewhere. Dr. Bevan decides that local anæsthesia, gas anæsthesia by nitrous oxide or ethylene, and ether anæsthesia are, generally speaking, the only admissible methods. Spinal, intratracheal, and the use of basal narcotics are all pronounced too dangerous for any but very limited employment. Dr. Bevan is sure of general support in his contention that "anæsthesia must be placed in the hands of trained experts"; less sure of it when, in spite of this, he places the choice of the anæsthetic and complete responsibility in the hands of the surgeon. Dr. Bevan appears to us to have under-estimated the harm of prolonged ether inhalations, and to have over-estimated the danger of the proper use of methods which are now employed to avoid those after-effects.

CENTENARIANS.[2]

CENTENARIANS are not nearly so common as is popularly believed, and the claims of many to the distinction will not bear investigation, though they are usually admitted. In recounting the lives of a short group of them Mr. Forbes Gray has been able to establish their right to the title without doubt or difficulty, and has attempted to concentrate on those aspects of their careers which shed light on the problem of longevity. He lays stress, that is, upon everything of psychological significance. He takes as examples of abnormal duration of life that warlike prelate, Leslie Bishop of Raphoe; a diplomatist, Richard Bulstrode, the devoted follower of the House of Stewart; a dramatist and actor, Charles Macklin, the introducer of "natural acting"; a scholar, Routh, the famous President of Magdalen, Oxford, who, by the way, died in his hundredth year as the author notes; a philanthropist, Sir Moses Montefiore; a physician, Sir Henry Pitman; a musician, Manual Garcia; a general, Sir George Higginson; and an admiral, Sir Provo Wallis. In the last chapter the lives of three women are recorded, the largest space being devoted to the description of Mrs. Haldane, the remarkable mother of the recent Lord Chancellor, Viscount Haldane, and of Prof. J. S. Haldane. The other two women centenarians are Lady Smith, the wife of James Smith, the botanist, and the Hon. Katharine Plunket, the still surviving daughter of the second Lord Plunket, Bishop of Tuam. Miss Plunket was born in 1820, and her fully established record makes of her a remarkable example. For Thoms's "Longevity of Man," a conscientious inquiry into some of the more striking instances of longevity that have been put on record, has much reduced the list of undoubted centenarians with sensational claims. For sometimes on what is practically no evidence at all, though with much suggestive support, men and women have gone down in popular history as phenomenally aged. The autopsy of "old Parr," most famous of these historic characters, was made by Harvey, as is recorded in the Sydenham Society's edition of Harvey's works, and Harvey accepted apparently the popular belief that Parr was born in the reign of Edward IV. This would have made him 150 years, at least, at the date of his death, but Thoms points out that, in spite of the wealth of detail apparently supporting this incredible longevity, nothing is proved beyond the fact that Parr was a very old man, probably just a centenarian.

[1] Jour. Amer. Med. Assoc., Nov. 21st, p. 1530.

[2] Five Score: A Group of Famous Centenarians. By W. Forbes Gray. London: John Murray. 1931. Pp. 322. 12s.

BIRMINGHAM MEDICAL DINNER.

THE special feature of the dinner of the Birmingham Medical School to be held in the Grosvenor Rooms, Grand Hotel, Birmingham, on Jan. 28th, will be a presentation to Prof. Leonard Gamgee by his past students upon his retirement from the chair of surgery. Prof. Gamgee was appointed assistant surgeon to the General Hospital in 1893, and became professor of surgery in 1919. Many students have passed through his hands and there is a general consensus of opinion that something should be done to mark his retirement. His work as surgeon and teacher has added greatly to the prestige of hospital and medical school; he has always loved teaching students and there must be many now in practice who would like to show their appreciation for all that he has done for them. Donations limited to £1 1s. and applications for dinner tickets (10s.) should be sent to Mr. Cyril Raison, F.R.C.S., 15, Cornwall-street, Birmingham.

AT a meeting on Dec. 10th, the Council of the Royal College of Surgeons of England considered the resolution adopted by the annual meeting of Fellows and Members affirming "that it is essential that Members, who constitute nine-tenths of the College, should be admitted to direct representation on the Council." In reply to this resolution the Council announced that they adhere to the opinion which they expressed last January.

Sir Arthur Stanley, chairman of the executive committee of the British Red Cross Society and Treasurer of St. Thomas's Hospital, has consented to become chairman of the Research Defence Society. This office was held by Lord Knutsford from the foundation of the Society in 1908 until his death last July. Prof. A. V. Hill, F.R.S., will occupy the post of vice-chairman which has been vacant since the death of Mr. Stephen Paget, founder of the Society, in 1926.

APPLICATION is invited for the post of dean of the new British Post-Graduate Medical School. Particulars will be found in our advertisement columns.

WE regret to announce the death of Dr. J. A. Lindsay, consulting physician to the Royal Victoria Hospital, Belfast, and emeritus professor of medicine in Queen's University, Belfast. He died on Monday last in his 76th year.

PUBLIC HEALTH SERVICES

THE MENTAL DEFICIENCY PROBLEM AND ECONOMY IN THE SOCIAL SERVICES.

THE present financial stress raises afresh the problem of mental deficiency. There is a danger that the state of public affairs will delay or even cause the abandonment of schemes already devised for making provision for the feeble-minded. These schemes are often unpopular, they involve a large capital outlay, and few people realise the urgency of the matter. Nor is it generally understood how costly to the community are defectives at large in society. In times of serious trouble humanitarian efforts slacken, and if the State cannot afford to make provision the weak and ailing will suffer. Public calamity involves regression, for we cannot escape the inexorable law of survival in hard and perilous times.

THE COLONY AND ITS ECONOMIC PLANNING.

Thus at the moment the economic test must prevail and the problem is what is the least costly method of dealing with mental deficiency? One aspect of this is dealt with in the report [1] of a Departmental Committee appointed by the Board of Control under the chairmanship of Mr. Walter Hedley, K.C. The committee were appointed to consider a report "what are the essential structural requirements of a complete colony for mental defectives of all types"; they were also to consider "how the capital expenditure might be reduced by the adoption of temporary buildings and other new methods of construction."

As regards size, the committee recommend that the minimum size of a complete colony should contain 880 beds. This provides for the classification of adults into five groups of each sex, in separate buildings accommodating 60 patients in each, with two smaller buildings for the more troublesome, with 40 beds in each. In addition, there would be four homes for children, with 50 beds in each, and a hospital block providing for 20 patients of each sex. A colony of this size is perhaps the smallest that would justify the appointment of a resident medical superintendent. The committee further suggest that the maximum size of such a colony should be in the neighbourhood of 1270; the individual units should not be larger, but the greater numbers would permit more efficient classification. Many local authorities do not need such large colonies, and for these combination with other authorities is recommended. It is interesting to find in the annual report of the Board of Control 11 authorities have already acquired estates for establishing mental deficiency colonies, and at least six others are contemplating joint boards for this purpose.

As regards area, the committee recommend that at least one acre is needed for every ten patients, if adequate accommodation is to be provided with a satisfactory lay out and sufficient ground is set apart for outdoor occupations. Throughout the report the aim is to make the colony as self-supporting as possible, and to provide a great variety of interests, and to this end suggestions are made dealing with administrative offices, workshops, school, recreation hall, market gardens, greenhouses, poultry, dairy, and many other features of a well-ordered community.

Considerable attention is given to the planning of the individual homes, the air space, the number and arrangement of beds, the baths and lavatories. Accompanying the report are several suggested plans of the homes which form the units of the colony. It is significant that the new committee have not been able to make suggestions to lessen the cost of buildings to any material extent from the plans previously recommended by the Board of Control. With reference to alternative methods of construction, the committee find that there is a saving of from £25 to £50 per bed in capital cost by the erection of temporary buildings, and that the time taken during construction would be materially reduced. On the other hand, the annual charges would be greater, and the committee concluded "there is little likelihood in general economy resulting from the adoption of semi-permanent or temporary methods of construction, except in the case of workshops, farm buildings, and similar structures."

SOME PROVISION MUST BE MADE.

The general principles which should guide authorities in giving effect to the provisions of the Mental Deficiency Acts are now clearly stated, and there can be little doubt that the findings of the committee will be generally accepted as conclusive. No doubt smaller units would be preferable, and decentralised cooking more home-like; and it would be desirable to spread out the colony more like a village were it not for limitations arising from the expense of roads and water mains. These are, however, minor details. The scheme proposed provides a colony with a satisfactory classification of patients, and it is vastly preferable to barrack-like buildings with great dormitories and long corridors, giving little or no opportunity for home-like conditions.

The committee refer to "the grave danger that the further successful carrying out of the provisions of the Mental Deficiency Act, 1913, may be impeded, if not altogether prevented, by the refusal of local authorities to face the cost unavoidably involved is in our view clearly shown by the small progress made since the war in the provision of colonies." The report is dated March 26th, 1931, and since then the financial position has become more serious, and the question arises in which way does true economy lie? The main facts are now well understood. We know from the fourteenth report of the Board of Control (p. 43) that at least one person in every 1000 of the general population needs institution care and training, this apart from those who are placed under statutory supervision and guardianship.

In the last (seventeenth) report of the Board of Control we learn that in no part of the country is sufficient provision made for defectives needing care in institutions. Twenty-two local authorities have made no provision whatever and 44 have only provided for less than 0·25 per 1000 population. The result is that there is a constant demand for places in certified institutions or in colonies elsewhere. Generally speaking, it is impossible to find room for high-grade cases with violent or immoral tendencies, or for the low grade needing nursing care. As a consequence mental defectives either drift about in the streets, or are placed in poor-law institutions, most of which are altogether unsuitable, or are sent to the mental hospitals.

The last-named procedure is wasteful, and yet in all our mental hospitals are found large numbers of defectives who but rarely can receive proper training

[1] Colonies for Mental Defectives. H.M. Stationery Office. 1931. 2s.

and so tend to deteriorate. Authorities would save much if defectives were at an early age removed to a colony and prevented from becoming the greater charge to society that residence in a mental hospital involves.

Another fact is well established. Almost all defectives improve greatly with proper training. They become happier, healthier, and many learn to contribute to their support. It is true that very few recover, though some are able to have leave of absence on licence. In some districts there are hostels for selected high-grade girls, who undertake daily domestic service, and do well under these guarded conditions. Nevertheless, broadly speaking, mental defect is permanent, and consequently in some way or other feeble-minded persons must be provided for.

POSSIBLE ALTERNATIVES.

The question is whether it is more economical to ignore the problem (we have heard of a chairman of a county council who boasted there were no defectives in his county) and so allow the feeble-minded to be a burden to parents and relatives, or become criminals, or swell the numbers of the unemployed.

The placing of defectives under guardianship in a private house tends to lessen the capital expenditure required in establishing a colony. In the last report of the Board of Control it is stated that 1357 defectives were so placed. Many of these were living with relatives, and the local authority contributed to their maintenance. This is very successful in certain cases; the defective may be very happy under home conditions. Yet it is doubtful whether in this country it can be largely extended. It is noteworthy that in certain countries, where the boarding out of patients is still largely practised, it was started at a time of economic stress when housewives were glad to receive a resident patient who brought a welcome addition to the family income. But in the industrial areas of the British Isles conditions are much less favourable, and it must not be forgotten that a defective in a private home rarely has opportunity for the training and regular occupation that obtains in a colony. There is less chance of improvement, and much greater risk of misconduct in many directions.

The magnitude of the problem is greater than the public realises. The Board of Control estimates that institution accommodation is needed for at least 18,500 more defectives, and even if all the schemes already under consideration are carried out the problem will not be solved. The matter has three aspects: the economic, the eugenic, and the humanitarian.

As regards the first, we believe it will be true economy to increase the number of colonies for defectives. The wastage of effort in supervising defectives is immeasurable, for every defective at large takes up valuable time of someone, even if there be no criminal tendencies and no direct cost to ratepayers. It is impossible to work out the relative cost to the community generally of colony life and the alternative haphazard method of drift, which means untold expenditure of time and effort by giving freedom and licence to the incompetent and unfit. The defectives are a terrible expense whatever be done, but there is good reason to believe that early segregation is really the least costly method of meeting the problem.

From a eugenic point of view there is little to be said. Colony life gives increased health and greater possibilities of usefulness without the danger of burdening posterity with an increasing number of defectives.

The humanitarian point of view may count for less in these difficult times. Anyone familiar with life in a colony knows how happy it may be. The visitor will find a contented population; he will be greeted with cheerful faces, and be eagerly shown samples of work, and given exhibitions of occupations, games, and amusements. He will have no doubt regarding the benefits of colony life. Much could be written of the varied activities, the busy workshops, the gardening, singing, dancing, in which the higher grade patients become remarkably proficient. It is remarkable how occupation is found for almost all, and how even the low grade improve in conduct and habits. In the villas containing the helpless patients the visitor is heartened to see the devotion of the nursing staff, and though he may wonder why such patients are permitted to live, the care and attention given to them awakes a feeling of gratitude that society ministers even to these.

A STRONG CASE.

There is therefore a strong case even at the present time to proceed with the establishment of colonies. Without entering on debatable ground, it would seem that this is the sort of work that the unemployed men in the building and allied trades might wisely be given.

In this connexion the following words of John Conolly are appropriate, although written[1] long ago:—

> "None but those who live among the insane can fully know the pleasures which arise from imparting trifling satisfactions to impaired minds. . . . None else can fully know the value of diffusing comfort, and all the blessings of orderly life, amongst those who would perish without care, or each of whom would, if out of the asylum, be tormented or a tormentor." And speaking of his patients he says they are "his friends; humble, but not without even delicate consideration for others; wayward, but not malignant except when cruelty exasperates them; capricious, but not ungrateful; distrustful, but to be won by candour and truth; disturbed and grievously afflicted, but not dead to some of the best and purest affections."

Though written chiefly of the insane, these remarks apply equally to mental deficiency.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 5TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 57 (last week 56); scarlet fever, 1708; diphtheria, 1083; enteric fever, 35; pneumonia, 1181; puerperal fever, 35; puerperal pyrexia, 105; cerebro-spinal fever, 33; acute poliomyelitis, 7; encephalitis lethargica, 12; continued fever, 1; dysentery, 18; ophthalmia neonatorum, 91. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Dec. 8th–9th was as follows: Small-pox, 112 under treatment, 3 under observation (last week 112 and 13 respectively); scarlet fever, 1585; diphtheria, 1568; enteric fever, 12; measles, 406; whooping-cough, 435; puerperal fever, 18 (plus 14 babies); encephalitis lethargica, 223; poliomyelitis, 4; "other diseases," 195. At St. Margaret's Hospital there were 11 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (1) from enteric fever, 39 (6) from measles, 3 (1) from scarlet fever, 29 (5) from whooping-cough, 39 (7) from diphtheria, 60 (18) from diarrhœa and enteritis

[1] The Construction and Government of Lunatic Asylums. London, 1847.

under two years, and 90 (16) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London occurred at Birmingham, Halifax, Rotherham, and Hull. Eleven deaths from measles were reported from Stoke-on-Trent, 7 from Manchester, 5 from Carlisle. Liverpool reported 8 deaths from whooping-cough, Birmingham and Manchester each 3. Diphtheria claimed 4 victims at Manchester, 3 each at Liverpool and Hull. Diarrhœa was credited with 5 deaths at Liverpool, 4 each at Stoke-on-Trent, Birmingham, Nottingham, and Manchester. The fatal cases of influenza are reported from 41 great towns, the higher numbers being in Liverpool 6, Manchester 5, Stoke-on-Trent and Newcastle-on-Tyne each 4.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 45 per 1000 births), including 58 in London.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of three counties.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Yorkshire. West Riding (1,534,050)	16·9	11·4	0·77	1·33	1·5	2·2	65/	28	6·2
Lancashire .. (1,806,960)	14·0	11·9	0·72	1·42	1·6	2·3	64/	28	6·2
Somerset .. (404,870)	14·3	11·7	0·62	1·61	1·2	2·4	46/29	12	4·3

Registered stillbirths per 100 live births: West Riding, 4·9; Lancashire, 5·4; Somerset, 4·7.

West Riding of Yorkshire.

Dr. T. N. V. Potts says the infant mortality-rate is still capable of further reduction. Of the 1689 infant deaths, 882 were due to congenital conditions, &c., and in connexion with these deaths, he refers to the definite and suspected cases of attempted abortion as a cause of constant concern. It may be assumed also that a proportion of the 1222 stillbirths registered were also due to illegal interference. The maternal mortality from childbirth is distinctly higher in the West Riding than in the country generally. The rates for the three years preceding 1930 were 5·18, 5·45, and 5·24.

The subject of hospital accommodation is receiving attention from at least four standing committees of the county council, and as the interdependence of the different types of institution becomes increasingly apparent, each of these committees will need to have constant regard for the activities of the others, if the best interests of the county are to be served. There are 38 isolation hospitals and 30 small-pox hospitals, some of them controlled by joint hospital boards and committees and 28 by separate district councils. The beds vary from a minimum of five to a maximum of 97, and one small hospital may be full to overflowing whilst another in the neighbourhood is almost empty. The scheme of the county councils divides the 1½ million acres of the county into ten areas for general infectious diseases and into nine for small-pox, with a free interchange of beds among the hospitals as necessity arises. When the areas have been grouped there will be a surplus of beds in some cases and a need for building extensions in others. The county council will make a grant of 50 per cent. of capital expenditure needed for extensions. There are 22 public assistance institutions and one separate hospital at Keighley which have been transferred. Major operative surgery is carried out at Otley, Batley, and Wakefield institutions and at Keighley hospital, these being the only four provided with operating theatres. Patients needing an operation are transferred to one of these or to a voluntary hospital. Batley institution is the only one with an X ray plant. The 22 institutions have 78 maternity beds but only about 350 women were admitted for confinement during the year. The county council is giving special attention to the maternity hospital requirements of the south Yorkshire area. Dr. Potts lays emphasis on the increasing demand for maternity beds and the urgent need for coming to an agreement with the general hospitals in the county boroughs, seeing that the maternity services provided by such hospitals for abnormal cases could only be replaced by the county council at a prohibitive cost. There are still some districts inadequately supplied with midwives, and during the year the areas served by district nursing associations have been rearranged and increased grants for motor transport have been allowed. Dr. Potts makes the useful suggestion that practising midwives should be sent to maternity homes run by the county council for practical refresher courses, lasting for a month or longer. The midwives attended 14,282 births as midwives and 2785 as maternity nurses, equivalent to over 65 per cent. of the total births.

There were 148 cases of enteric fever with 28 deaths. At Honley, where a considerable epidemic occurred last year, an outbreak of 11 cases was attributed to a "carrier," who has now taken up another occupation. Cerebro-spinal fever has lately increased in prevalence. In the three years, 1926–28, the notifications were 8, 9, and 8. In 1929 they rose to 20 and in 1930 to 115. In 1931 the disease has assumed epidemic form in areas chiefly around the original focus at Thorne. The notifications up to the end of June, 1931, numbered 420. The case-fatality is about 50 per cent. and in many cases death has occurred within 24 hours. The number of new cases at the large venereal department centres varies little from year to year, but at such centres as Keighley and Goole, where the population is stationary and non-fluctuating in character, there is a considerable diminution and Dr. Potts infers that the post-war prevalence has been overcome in these areas and that the clinics now provide modern treatment for a normal incidence of infection.

Dr. Potts refers to a Ministry report of 1928 comparing the tuberculosis schemes of Lancashire and the West Riding. Among other things it was indicated that in Lancashire more new cases were examined, more consultations were held, and more home visits paid; also more residential treatment for non-pulmonary cases and more provision for the segregation of advanced pulmonary cases are made in Lancashire. Furthermore, the facilities for arriving at an accurate diagnosis were better in Lancashire. Dr. Potts agrees with these conclusions and submits recommendations for the improvement of the West Riding scheme, under which the 11 dispensary areas will be reduced to five, with a consultant officer for each; each dispensary will be equipped with X ray and ultra-violet ray facilities and the clerical staff will be increased; new dispensaries will be provided in certain districts and better premises in others; the hospital accommodation for advanced cases at Crookhill Hall will be increased.

Lancashire.

Dr. J. J. Butterworth's report consists mainly of tabulated details with respect to the 19 municipal boroughs, 81 urban districts, and 19 rural districts which make up the administrative county. About one-seventh of the population is in the rural districts. The county health department has been much occupied during the year with work incident to operating the transferred public health functions and with the preparation of reports to assist in the rearrangement of the county districts. The poor-law institutions

transferred numbered 14 with 1758 beds for men, 1937 for women, and 299 for children. The county council pays in subscription to voluntary hospitals about £3500 per annum and about £2000 to nursing and other associations. The transferred institutions admitted 1083 cases for confinement during the last nine months of 1930, and the county council sent 175 maternity cases into 25 hospitals in various parts of the county. The payment for the latter amounted to £1433, of which £578 was recovered from the patients.

The percentage of infectious cases removed to hospital throughout the county was for scarlet fever 54·7, for diphtheria 66·7, and for enteric fever 66·3. Cases of enteric fever numbered 95, with 16 deaths, and 73 of the county districts were entirely free from this disease in 1930. Diphtheria continues to show the progressive increase noticeable in recent years. There were 1872 cases with 124 deaths—a case-fatality of 6·6 per cent., as against 7·4 in the preceding year. During the last ten years there were 1094 notified cases of encephalitis lethargica with 660 deaths, and 181 notified cases of acute poliomyelitis with 47 deaths. The notified cases of cerebro-spinal fever in 1930 were 12 and the deaths registered from this cause 16. An outbreak of epidemic catarrhal jaundice affected the scholars of three schools in the townships of Woodplumpton, Catforth, and Lea, and one adult. The schools were separated by a mile or more from one another and had little intercommunication. Three other schools in the townships were not affected. In the first school there were eight cases, seven of which were supplied by two families; in the second school there were eight cases, five supplied by two families; and in the third school there were nine cases, six of whom came from three families. In most cases there was a history of lassitude preceding the actual onset, and the most prominent symptom was intractable vomiting. Some had pain in the gall bladder area and the patient was usually more comfortable after the jaundice appeared on the second or third day. A virulent outbreak of diphtheria occurred among the children of Hart Common School, Westhoughton. This is a mixed school of 192 children, 27 being under the age of 5. After the first two cases the school was closed from June 16th to 27th, but in July four fresh cases were notified. Altogether there were 15 cases, of which eight ended fatally. Massive doses of antitoxin were not used. As the result of the epidemic 51 per cent. of the other children were immunised with the consent of the parents.

For the purposes of milk legislation the county council employs, as required, 30 veterinary surgeons resident in all parts of the area. Of 773 samples of milk submitted by 45 of the local authorities, 79 were found to be tuberculous. There are 7600 dairy farms, and the cow population is about 81,000. Designated milk has not made much headway as there are only five licences for Certified milk issued by the Ministry, 45 licences for Grade A milk issued by the county council, and seven licences for pasteurising plants. Of 2949 samples of milk examined for adulteration, 3·4 per cent. were returned as adulterated. The list of the fines imposed for adulteration of milk indicate that the magistrates regard this offence leniently. Thus the maximum fine appears to be £5. This maximum was imposed in respect of a milk 18 per cent. deficient in fat and 22 per cent. in solids not fat, whilst a deficiency of 23 per cent. in fat and 20 per cent. in solids not fat only earned a fine of £2. Milk adulteration in Lancashire should be a profitable occupation. Public abattoirs have been provided at seven of the boroughs and four of the urban districts. In about 56 districts a shortage of houses at reasonable rents is reported, and in about 30 districts some action has been taken or is contemplated to deal with unhealthy areas.

Somerset.

Dr. W. G. Savage refers to the large proportion of old persons in the population. Thus 55·5 per cent. of the deaths were at ages over 65, and the death-rate from all causes, when standardised, becomes 9·3. The effects of the Local Government Act, 1929, are gradually making themselves apparent in public health work, but no extensive changes occurred during the year as regards the treatment and provision for treatment of the sick-poor. Several of the old poor-law institutions have been given up and on April 1st, 1931, there were 12 in use. Most of this accommodation is suitable for the infirm and chronic cases which occupy nearly all the beds, but the accommodation for the few acute cases is inadequate in all but two or three infirmaries. The new infirmary at Chard was opened in May, 1931, and provides 50 beds on modern lines. The county is well supplied with voluntary general hospitals. No consultations with the voluntary hospitals have been held as yet and Dr. Savage recommends an early inquiry as to the institutional needs of the county as a whole, and to the relief of areas with waiting-lists. Such an inquiry should precede piecemeal additions to institutional accommodation. The conditions under which medical out-relief is granted and the factors governing admission to hospital would form part of such an inquiry. Two of the institutions have been appropriated for mental deficiency and two have been closed except for casuals. Steps are also being taken to group beds for tuberculosis and maternity, and to improve the conditions for children maintained under the poor-law.

A detailed review of the water-supply of every parish in the county is contained in the present report and will be valuable when a comprehensive survey of water-supply problems is considered. Dr. Savage thinks it would have been more economical and satisfactory if the control over infectious disease had been transferred to the county council, which is now a partner in isolation hospitals, provides laboratory facilities for diagnosis, and is also concerned with infectious disease as education authority and as maternity and child welfare authority for most of the county. Compared with 25 years ago, the fatality of pulmonary tuberculosis has declined 40 per cent. and of non-pulmonary tuberculosis 59 per cent. The provision of additional accommodation for non-pulmonary and for advanced pulmonary tuberculosis is under consideration. Artificial pneumothorax treatment in the county has been begun by sending patients to Quantock Sanatorium for the primary induction and to the nearest tuberculosis dispensary for refills. Up to now patients have only been treated by this method when ordinary treatment had failed or was not likely to be successful. Of the first 17 cases, the results are very encouraging in 15.

The health visitors in their new capacity as infant life protection visitors have supervised 258 boarded-out children. The number of foster-mothers who take in one child is 128; 18 take two children; six take three; three take four; and four take more than four. The last group includes homes authorised at Taunton for 35 children, at Bridgwater for ten, at Portishead for eight, and at Easton-in-Gordano for five. One foster-mother has had to be removed from the list and several applications to act have had to be refused.

Sampling of 344 mixed milks revealed eight tubercle-infected, and outside authorities sent five complaints. One sample in each group came from the same farm, leaving 12 cases for investigation. One milk was from a creamery receiving milk from many sources and the infection could not be traced. In 10 out of 11 cases the infecting animal was destroyed, and in the eleventh case a very suspicious animal had been sold. No trouble has been caused by the effluents from the many milk depôts in the county during the year.

EAST HAM ISOLATION HOSPITAL.—Mr. Arthur Greenwood, the late Minister of Health, recently opened an administrative block and other extensions at this hospital. The enlargements include two new blocks, one of which provides 14 separate bed wards and a theatre, and the other a 10 and a 14 bed ward and two special case wards. The cost has exceeded £40,000.

SPECIAL ARTICLES

WINTERING IN ENGLAND.

A MEDICAL STATEMENT.

IN response to the influentially signed invitation which appeared in our columns last week (p. 1263), an open meeting of members of the medical profession was held on Dec. 9th at the Institute of Hygiene. The chair was taken by Dr. W. G. Willoughby, President of the British Medical Association. Letters of goodwill and apologies for absence were read from Sir Thomas Oliver, Sir George Newman, Sir Robert Philip, Dr. J. M. Nichol, and the Bath division of the British Medical Association.

The Chairman said that economic conditions had suddenly focused attention on British health resorts, which had not in the past had the credit they deserved. In many ways their advantages had not been fully realised, and people had been sent abroad when they would have been much better at home. On the other hand, the advantages of foreign resorts had been over-estimated. The range of the means of temperature met in Nice was about twice that of British south coast resorts; the average daily sunshine in Nice was 3·99 hours; on the south coast of England it was 2·5 hours. The rainfall of Nice approximated to that of England. The differences did not justify long journeys and inconvenience. The desert also had been overrated; in Dr. Willoughby's war experience the night temperature had fallen in the Libyan desert 60° F. from the day temperature, and there had been coughs all over the camp. It was important not to exaggerate. The British climate was curious and changeable, but it had suited the British for many generations and enabled them to stand almost any climate. There would, however, always be a certain number of people to whom foreign travel would be of value. No special town or locality should be signalled out for mention, but districts should be taken as a class. The question of spas was not before this meeting. It was essential to have amenities—good music and entertainment—and local authorities wanted waking up in this respect. He read a letter from a south coast resort showing that open-air tennis had been played there on two days out of three throughout the winter. If a statement could be put out, he concluded, a great thing would have been done for England and for the health of the people of England.

THE PROPOSED STATEMENT.

Dr. R. Fortescue Fox explained that the statement was the outcome of a series of meetings of medical men and others interested; it had been drawn up by the medical members, and had had very careful examination, but was open to criticism by the meeting.

The statement declared that there was a profusion of places suitable for winter visitors, although many of them were not yet adequately equipped. Only the seaside for winter seasons would be considered. Many southern and western resorts had equable sheltered climates, unaffected by Polar currents and protected from easterly winds. The British islands enjoyed a climate 20° F. warmer than was proper to their latitude, owing to the Gulf Stream.

The average temperature from November to March was 24° F. in the Alps, 45° F. in south-west England, 49° F. at Nice, and 67° F. at Assouan. The daily range of temperature was 19° F. in the Alps, 18° F. at Nice, 28° F. at Assouan, and 8–10° F. in the west of England. English nights were warmer than Riviera nights, owing to protecting clouds. The humid British resorts were very favourable to health in many cases. The western coast was stormy, but fog and mist were uncommon. The Channel Islands had slightly higher air and sea temperatures, and more sunshine. The south was 2° cooler than the south-west but sunnier. The air became more bracing towards the east, and the blending of sedative western with tonic eastern air gave the south-east coast a special quality, well suited for rather robust people, especially children. The daily winter sunshine record for the south averaged 2¼–2¾ hours.

The seaside was one of the surest means of mental and physical refreshment. Health disturbances which often preceded disease in middle life might be allayed by marine climate, with diet, baths, and rest. The sedative influence of the south-west made the breathing easier, and allayed respiratory catarrh, encouraged the action of the skin, diminished tissue changes, and reduced the tension of the circulation and nervous system. The stimulant effect of the south east increased the cooling of the body and the activity of the heart and excretory organs, made larger demands on digestion and tissue change, and increased nervous activity. This was especially beneficial after catarrhs and influenza, and in convalescence. Although many places had provided the social amenities necessary, there was still much to be learned from continental resorts. Pleasant employment and distraction were necessary to the pursuit of health. It was also desirable that the cost of accommodation be reduced.

Dr. Fox added that the figures in the statement had been taken from a trustworthy source, and had recently been confirmed by Dr. Edgar Hawkins, author of "Medical Climatology of England and Wales," London, 1923. British health resorts had never yet had "a loud speaker"; what was needed was a discriminate appreciation, not indiscriminate praise. The British spas were the most tonic spas of the world, but it would be better not to complicate the present effort by attempting an appreciation of the winter service of these spas.

Colonel R. H. Elliot described the origin and development of the movement. The attitude of the medical profession, he said, was different from that of the rest of the population, and the medical side of the question must be first considered, but the profession would have in time to face such matters as amenities and cost. The advantages of British health resorts were: good sanitation; excellent food—plain and familiar; beautiful country, full of interest; mild climate and plenty of winter sunshine; the care of doctors of our own race—"the best doctors in the world"; and the saving of a long and exhausting journey. Patients demanded a greater standard of comfort than most hotels had given in the past—warmed rooms, baths, hot and cold water in the bedroom, varied menus, and reasonable rates—and insisted on freedom to do what they wanted. They would not go to places if they could not get these things, or if they were to be told how to spend their Sunday evenings. The movement must not cause a rise in hotel rates, and must secure the coöperation of all the interests involved. It would bring great benefit to all kinds of trade. The present offered an opportunity that might not recur in a generation, and the first year must be a great success. The other interests looked to the medical profession to give the movement a start.

DISCUSSION OF THE STATEMENT.

Mr. J. W. Dulanty (High Commissioner of the Irish Free State), the only layman present, asked for the inclusion of a statement relating to winter resorts in Ireland, where the pound was still worth 20 shillings.

Sir William Willcox suggested the addition of a paragraph for the man in the street, somewhat to this effect: "It is the considered opinion of the

medical profession that anyone seeking health can find it in the British Isles, the health resorts of which are second to none in the world." He thought that a mention might be made of spas.

Dr. K. R. Hallowes said he did not think enough had been made of the real differences in the climate along the south coast, although the sunshine average was much the same. It was important to know whether provision was or was not made for invalids in a resort.

Dr. T. Watts Eden spoke of the difficulty he had found in persuading women to go to British resorts, where his patients were sure they would be bored to death. Someone ought, he said, to write a treatise on the therapeutic value of dullness. But the point was what could be done at the moment; and that was to persuade the medical profession to recommend English resorts more. The statement could not be expected to go into the homes of the people; all that could be done was to give it as wide usefulness as possible in the hands of the profession.

Dr. E. P. Poulton thought more might be said for the east coast. Bad winds were only experienced there in March and April, and in other respects it compared very favourably with the other areas.

Dr. R. A. Young said that, if our climate was "made up of samples," those samples, like all British samples, were as good as they could be. The statement should go first to the medical profession, but must go later to the other interests; the "amenity and hotel" aspect of the problem must be dealt with somehow. The doctors should make a more careful and detailed study of climatic conditions and their effect on health, and publish some concerted review of the various areas.

Dr. Egbert Morland remarked on the need for local committees, on which the medical profession was represented, to frame the amenities of a wintering place.

Dr. Geoffrey Holmes said that there was already a movement in health resorts for medical men and municipal authorities to get together. He asked whether the movement could not be extended to cover the summer. The average medical man in this country, he said, knew nothing of climatology or local arrangements, and the statement might well draw attention to the valuable section in the Medical Directory. The movement should also get in touch with the Spa Practitioners' Group of the British Medical Association. It did not, he said, pay travel agencies to recommend people to stay in Britain if they could be persuaded to go abroad; there was a strong financial interest involved.

Many other points were made briefly. Sir Bruce-Bruce-Porter called for a Central Bureau in London. One speaker urged the need for immediate action, the winter being already on us. Another mentioned the Association of Health and Pleasure Resorts as a suitable body to deal with hotel amenities. Another thought that since the vast majority of people going to resorts were well people, most hoteliers would not consider it worth their while to bother about invalids. Some who were impressed by the low standards of hygiene in certain areas thought the hotel-keepers would take note of what the doctors said.

PRACTICAL ACTION.

On being put to the meeting the statement was unanimously accepted, subject to minor adjustment, and issued to the press.

The chairman moved the appointment of a medical committee to start a central bureau, and it was agreed to include all the signatories to the letter—viz., Sir Farquhar Buzzard, Dr. T. Watts Eden, Colonel R. H. Elliot, Dr. R. Fortescue Fox, Sir Thomas Horder, Dr. R. Hutchison, Dr. E. P. Poulton, Sir Humphry Rolleston, Sir StClair Thomson, Sir William Willcox, Dr. W. G. Willoughby, and Dr. R. A. Young, with the addition of Dr. R. King Brown and power to coöpt a representative of every local area.

To this committee was remitted the formation of a coast organisation with a London bureau, and the early promotion of a conference ofall interests.

GENERAL MEDICAL COUNCIL.

(Concluded from p. 1318.)

Committee Business.

AT a meeting of the Executive Committee which preceded that of the Council the official notification of the reappointment of the following members of the Council was read:—

Leonard Parker Gamgee, M.S., F.R.C.S., as representative of the University of Birmingham for the term of five years from July 2nd, 1931.

Edward Magennis, M.D., as representative of the Apothecaries' Hall of Ireland for the term of three years from August 1st, 1931.

Sir John William Moore, M.D., as representative of the Royal College of Physicians of Ireland for the term of one year from Oct. 18th, 1931.

Charles Thomas Samman, M.R.C.S., as representative of the Society of Apothecaries of London for the term of one year from Dec. 4th, 1931.

Alfred William Sheen, C.B.E., M.S., F.R.C.S., as representative of the University of Wales for the term of one year from Oct. 1st, 1931.

Sir Humphry Rolleston, Bart., G.C.V.O., as representative of the University of Cambridge for five years from Nov. 9th, 1931.

The Council received a communication from the Privy Council, intimating the passage of an Order in Council sanctioning the return of an additional member representing the registered practitioners of England and Wales.

QUALIFICATIONS IN FRANCE.

The Privy Council had forwarded to the Council last July a copy of a Bill which had been submitted to the French Senate in April, 1930, to modify the law concerning medical studies and practice in France. The President had answered that the present requirements for the obtaining of a French qualification by persons holding foreign qualifications were already onerous, and that the new provision, that a foreigner who satisfied all the existing requirements for practice in France must become a naturalised Frenchman before being allowed to practise, was practically prohibitive. He had pointed out that British subjects might be deterred from taking up their residence either temporarily or permanently in France if they could not obtain a practitioner of their own nationality, and the comparatively moderate requirements made of French practitioners desiring to practise in this country. The Executive Committee formally approved the action of the President.

A MEDICAL COUNCIL FOR INDIA.

The committee had before them a draft Bill to establish an All-India Medical Council. This measure was drawn up to give effect to the conclusions of

a conference of provincial representatives held at Simla in June, 1930, and of course represents a daring innovation. There are two alternative schemes for the composition of the new body, one of which provides for fuller electoral representation of the medical profession. The president is to be nominated by the Governor-General in Council, and the provisions for enrolment and erasure are similar to those governing the British body. It will be able to arrange schemes of reciprocity, to exact information concerning curricula and examinations, and to inspect examinations. A provision of especial interest is that which sets up an appellate body, by empowering the Governor-General in Council at his discretion to refer complaints against the Council to a Commission of Inquiry consisting of a judge of a high court and a second member, both appointed by the Governor-General in Council, and of a third member appointed by the Council itself. This commission will have all the powers of a civil court, and its recommendations will be binding on the Council.

The Executive Committee registered the opinion that the measure would conduce to the improvement of Indian medical education, and serve the best interests of Indian medicine in general.

REGISTRATION IN VICTORIA.

The Executive Committee considered the Medical Act, 1928, of the State of Victoria, an Act which consolidates the law governing medical practitioners, dentists, and chemists.

The Registrar, in a note, pointed out that provision is made for the registration of any person possessing a British qualification, and for any person registered in the United Kingdom. Personal attendance is required for registration. There have been several cases in which practitioners with qualifications from the University of Melbourne who have registered in some other State of Australia have come to England and have been unable to register here because personal attendance is required for registration in Victoria. Practitioners registered on the Foreign List of the Medical Register can only register in Victoria if registered and legally qualified practitioners in Victoria are entitled to register in such country without examination. Practice by unregistered persons is not prohibited but they are under the same disabilities as unregistered persons in the United Kingdom. Dentists registered in the Dentists Register in virtue of qualifications are entitled to registration, but not those registered under the Dentists Act, 1921. Persons not British subjects may be registered. On the death of a practitioner his practice may be carried on by an executor for two months. The use of the words "Dental Company," "Dental Institute," and the like is prohibited. All practitioners must practise in their own name, and no company may act as intermediary for the purpose of procuring the supply of dental services. Practice by unregistered dentists is prohibited, and the British Pharmacopœia is adopted.

An amending Bill, introduced in May of this year by two members of the Legislative Assembly, provides for erasure in case of conviction of a felony or misdemeanour, of infamous conduct in a professional respect, or of habitual drunkenness; and for appeal to a judge of the Supreme Court in chambers. The Council expressed approval of these proposals.

FEES FOR PASSPORT DECLARATIONS.

A communication from the Passport Office was read, saying that complaints are from time to time received that medical men, and more particularly panel doctors, have refused to verify declarations for their patients except on payment of a fee. This was stated to appear to be open to objection, as the recommendation should be a personal one, and it was asked whether the Council would be prepared to take the matter up in a particular case if approached by the complainant. By direction of the President a reply had been sent that the practitioner had to read the paper carefully and to assure himself as to the correctness of what he was certifying; if in the circumstances he thought it right to charge a fee, the Council would hardly have grounds for taking exception, especially having regard to the fact that the question of fees was entirely outside the Council's jurisdiction. It was resolved that the reply sent by direction of the President be approved.

EDUCATION AND EXAMINATION COMMITTEES.

Prof. J. B. Leathes presented the report of the Education Committee. He expressed the regret of the Committee at the resignation of Sir Humphry Rolleston from its chair. A letter had been received from the British Medical Association asking the Council to use its influence to persuade medical schools to grant facilities for three lectures to first-year medical students on national health insurance practice. The Committee thought that the Association might itself approach the medical schools.

Prof. J. S. B. Stopford presented the report of the Examination Committee, dealing with inspections, and the President presented the joint second interim report on the report by the Society of Medical Officers of Health on the place of preventive medicine in the curriculum. A subcommittee is preparing a final report on this matter.

The report of the Dental Education and Examination Committee was received. The Committee recommended that the Council appoint a general practitioner to act as inspector of the examinations in dental subjects, and that four members of the Council be appointed to assist in considering the reports of visitors. These resolutions were put by Mr. W. H. Dolamore and were adopted.

PUBLIC HEALTH AND PHARMACOPŒIA COMMITTEES.

Sir John Moore introduced the report of the Public Health Committee. Two letters had been received—from the Faculty of Medicine of the University of Liverpool and from the University of Wales—objecting to the new rules for the Diploma examination, particularly to the inclusion of courses in radiology and electrology.

The report of the Pharmacopœia Committee was introduced by Dr. H. H. Dale, who pointed out that 1418 copies of the Pharmacopœia had been sold in the preceding year, leaving only 513 copies in stock. The new edition was already in galley proof, and the Pharmacopœia Commission deserved grateful thanks for the remarkable amount of work they had done. Much experimental work was still needed on the new material, and this would be carried on while the book was in proof. The commission had been in touch with the authorities responsible for foreign Pharmacopœias, and information had been exchanged. A new chemical method of standardising ergot was recommended by the subcommittee on ergot, and this method constituted a distinct advance.

Restorations to the Register.

The following names were restored to the Register: Jules Michael Ralph Flament and John Forrest Hamilton. The Executive Committee had before it a communication dated Oct. 15th, 1931, from the Royal College of Surgeons of England, notifying that Mr. Andrew Alexander Fyffe had been restored to membership of the College, from the list of which he was removed in 1930; and another communication dated Oct. 29th, 1931, from the Royal College of Physicians of London, notifying that the College had restored its licence. All his previously registered qualifications have now been restored to this practitioner.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

COMPULSORY PASTEURISATION.

EDINBURGH and Glasgow corporations are in conference on the obtaining of statutory powers to require that all milk produced for human consumption, unless certified or tuberculin-tested, should be pasteurised before distribution. In a joint report by Dr. John Guy, medical officer of health for Edinburgh, Mr. Gofton, chief veterinary inspector, and Mr. Allan Ritchie, chief sanitary inspector, state that a "small pasteurisation plant is not an economic proposition," but that "one of the large companies has expressed willingness to pasteurise milk at the rate of 1*d.* per gallon, and to return it in bulk, or alternatively to pasteurise milk and bottle it at the rate of 3*d.* per gallon, and would be prepared to give this scheme a trial for 12 months." They add: "We are of opinion, however, that compulsory pasteurisation would result sooner or later in the whole of the milk trade passing into the control of a very small number of large firms." They are agreed that the goal to strive for is the increased production of Certified and Grade A (T.T.) milk, and that this should be encouraged. It is suggested that there should be a conference on the subject by all the Scottish counties and cities associations. There is no suggestion that the municipalities themselves should bulk and pasteurise milk for all grades of producer, big or little.

THE PUNISHMENT OF THE CRIMINAL.

In an address on "Criminal Punishments, Past and Present," Sheriff Boyd Berry, commenting on Sir Robert Wallace's statement that 90 per cent. of offenders who had been put on probation by him had never come before the courts again, said: "So far as my own experience goes, and also the experience of other sheriffs in Glasgow, this estimate of Sir Robert Wallace's is an exceedingly optimistic one, as, in our courts, we see daily offenders in whose cases all the methods of admonition, probation, and reformatory treatment have all been tried in vain." These methods, he said, had no effect whatever in staying a persistent criminal career, but there was every reason to believe that in many cases the best of results had followed. On capital punishment, he maintained that the right of punishment of the individual being once conceded, the sole question came to be whether the death penalty was necessary in the interests of society. This was the consideration which had always actuated the State in relinquishing its powers against the individual, and it was the only one which should decide whether the death penalty was to be retained or abolished in this country.

A SAMARITAN SOCIETY.

The "voluntary system" has many supplementary mechanisms to enable the poorer classes to make use of the hospitals. In Edinburgh, the Samaritan Society, which has worked with the Royal Infirmary, the City Hospital, and the Deaconess Hospital for 52 years, has "taken care" of families where the mother or other cardinal member has to go to hospital or is otherwise brought to poverty by illness. Even a small regular allowance may keep a family above the official poverty line. The society may pay or subsidise the rent, or the fare home from hospital, or the charge for a period of convalescence. Such societies came into existence in the days when the acceptance of "public assistance" was a disgrace, and they survive long after the motive for their creation has largely lost its leverage, since sickness is now itself a ground for public treatment, and does not need the make-weight of destitution.

QUARRIERS' HOMES.

"Quarriers' Homes" is as well known in Scotland as the Clyde itself near which it stands. At the beginning of the latest year there were 1470 inmates, of whom 1206 were children, 173 consumptives, and 91 epileptics. During the year 148 children, 205 consumptives, and 31 epileptics were received. The income was £87,184. Between 1871, when the first home was opened and the present day, 19,614 children have passed through. Approximately £2,216,768 has been received, £373,062 being spent in building, and £1,796,103 on maintenance of homes, sanatoriums and colony, and home and foreign missions. This is a wonderful record for 60 years of individual philanthropy.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

RETRENCHMENT.

REPORTS of various subcommittees appointed by the Government of India contain recommendations of a sweeping character, which will not be pleasant reading for the departments and individuals affected. The general purposes subcommittee, of which Sir Abdur Rahim was chairman, proposes a general percentage cut in the pay of all Government officers, and a withdrawal of the Lee concessions, except in so far as they concern salaries. This would prejudice passage allowances and overseas pay, two of the most valued of the recently acquired privileges of the I.M.S. It is also proposed to increase the rents of Government-owned bungalows, and to inquire into special pay, travelling allowances, and other categories of payments. At present pensions, leave, and deputation salaries and allowances, paid outside India, are exempt from Indian income-tax. The suggestion is now made that this exemption should be withdrawn. The Director-General, I.M.S., is the object of special attack. The post is said to be a survival of the pre-reform régime, and the committee advise that it should be abolished. It is also proposed to reduce the public health grant by nearly one-half, to 7 lakhs of rupees. A saving clause in this ruthless document is the reference to the scientific services conducted by the Government of India, the importance of maintaining which is admitted.

A CHRISTIAN MEDICAL COLLEGE.

An ambitious scheme is under consideration by the Christian Medical Association of India for the foundation of a medical college. Already certain missions support training schools in association with some of their hospitals, but these have hitherto only dealt with students of the subordinate class. The idea now is to go a step further, and train for the full degree standard, in a central institution based on a large new hospital and self-contained in every way. The title Union Christian Medical College has been suggested, from which it may be inferred that the intention is to unite as many of the missionary bodies as possible in the movement. Allahabad has been proposed as a suitable centre. It is recognised that the missions unaided would be unable to finance a scheme of this magnitude,

but there is said to be a possibility of a large sum being provided by a group in America which is interested in the project.

THE INDEPENDENT PRACTITIONER.

Meanwhile there are many signs that medicine like other professions in India is, for the time being at any rate, overcrowded as regards existing opportunities for remunerative practice. Last year a committee which had been appointed to consider medical education in the Presidency of Madras presented its report. The committee found that there was evidence of increasing difficulty in earning a reasonable livelihood, especially amongst junior members of the profession, and that even in some comparatively wealthy areas, where opportunities for lucrative practice existed, many medical men were leading a hand-to-mouth existence. There are said to be good reasons for believing that the economic prospects of medicine are rapidly deteriorating, and that the struggle for existence is tending to lower both status and ethical standards, and to affect adversely the quality of applicants for admission to the medical schools. Attempts to induce medical men to settle in rural areas have been discouraging. Absence of social amenities and educational facilities for children are important factors, apart from the lack of financial inducements, and the *vaids* and *hakims* are likely to maintain their monopoly in villages unless some humbler and less expensive agency than the regular medical profession can be found to compete with them. The position is, of course, paradoxical. It is well known that, judged by western standards, the proportion of properly qualified doctors is quite inadequate, but the fact remains that in the present state of society there are more available at the moment than can be usefully employed. The committee concludes that instead of turning out the largest possible number of medical men and women from the existing schools and colleges, the policy of government should be to educate only as many as are likely to be able to gain a reasonable livelihood.

"MAKAWLAM."

An entertaining example of the pitfalls which beset practitioners of the indigenous systems of medicine—and unsuspecting British officials, who are sometimes too ready to accept their diagnoses—is forthcoming in the report of the Makawlam inquiry committee. Some years ago a new disease was reported from various districts in Burma, its name signifying "the spot (or fruit) gets ripe," referring to an eruption of spots or pimples at the margin of, or just within, the anus. The eruption was said to be invariably associated with fever. So serious were the depredations of this affection that Lieut.-Colonel J. Morison, an officer of the research department, was deputed by the Government of India to visit some of the areas affected and inquire into its origin. He took with him a full travelling laboratory, sufficient to undertake the examination of any febrile disease, with a skilled laboratory attendant, and it was only after prolonged travelling, and a thorough investigation of many cases, that he was able to produce convincing proof that the whole affair was a mare's-nest, the novel pestilence being only a manifestation of malaria, seen through the medium of indigenous medicine. The trouble originated from the Burman *vaids*, who for some unknown reason—perhaps owing to accidental anal irritation in one or two of the early cases—had taken to examining that region and, struck with the rugæ at the margin, proceeded to puncture or scarify them with thorns. To such an extent had this practice grown that the treatment of cases of fever of any kind, whether malaria or typhoid or small-pox, or even plague, was not considered complete without anal puncture.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

EPIDEMIC DISEASE IN FRANCE IN 1930.

THE student of epidemiology is bound to be more than a trifle confused, as far as France is concerned, by the variety of sources of information at his disposal. There are the annual reports of the departmental inspectors of hygiene, which do not always tally with the official statistics of the Ministry of Health; and there are also the monthly epidemiological reports of the Health Section of the League of Nations. After commenting on the embarrassment which this diversity of sometimes contradictory data has caused him, Dr. E. Lesné presented to the Academy of Medicine on Nov. 24th a very interesting survey of the epidemic diseases in France during 1930.

Acute anterior poliomyelitis, he said, was epidemic in the Department of the Bas-Rhin, where 405 typical cases were notified, an incidence of 60·5 per 100,000 inhabitants. The epidemic culminated in July with 220 cases, and there was a slight recrudescence at the beginning of September. As great a proportion as 84 per cent. of the patients were under the school age, and only 1 per cent. were over 21. The mortality at all ages was 10 per cent., and it rose with the age of the patient, reaching 20 per cent. among adolescents. The epidemic kept to the valleys and water courses, its progress being abruptly arrested at the foot of the Vosges. The synchronous meteorological conditions suggested that high temperatures favoured the epidemic. Although it was worst in the areas supplied with surface water, inquiries made in individual cases always failed to exclude the possibility of transmission of the virus by human contacts. In other words, no unquestionable case could be discovered of transmission of the disease by drinking water or by eatables. The total number of notifications in France was 1530, but there were doubtless many more cases than that.

Diphtheria.—In 1929 there were 20,400 cases of diphtheria notified in the whole of France. In 1930 this number had risen to 23,700. At Dijon the mortality from diphtheria per 100,000 inhabitants rose from 2·4 in 1929 to 13·1 in 1930. In the Bas-Rhin the notifications rose from 395 in 1929 to 885 in 1930; and the mortality was four times greater in this year than in 1929. But in Paris diphtheria is on the wane, and in its suburbs the disease is stationary. Lesné observed that diphtheria has almost doubled itself during these two years in Germany, and that its incidence in the first quarter of 1930 in Germany was approximately equivalent to its incidence in France for the whole of 1930. It would seem that vaccination against diphtheria has made definite progress, no department having failed to make great efforts to promote it, and the result is that the educated public is beginning to ask for it. But Lesné holds that it will never be really effective until it is made compulsory.

Typhoid and Paratyphoid Fevers.—The definite decline in the incidence of these fevers is correlated with the improvements in the water-supplies

throughout France, and with the extension of specific vaccination against these diseases.

Measles, Scarlet Fever, and Cerebro-spinal Fever.—Although measles occurred more frequently in 1930 than in 1929, reports from all over the country indicated that it was very benign. Scarlet fever showed no change from 1929. It is curious that while there were only some 14,000 cases in France throughout the whole of 1930, there were as many as 35,000 notified in England in the first quarter only of this year. Cerebro-spinal fever seems to be on the wane in France, only 412 cases having been notified in 1930 as compared with 467 in 1929.

PHARMACEUTICAL PREPARATIONS FOR INMATES OF PRISONS.

The ingenuity of practitioners is often taxed beyond breaking-point by the samples of pharmaceutical products flung at them. Try them on the dog? Or let them accumulate in cupboards? The latter alternative certainly follows the lines of least resistance. Perhaps this is why the cupboard habit is so universal. But examined closely and critically, it seems a negative, defeatist, and cowardly reaction on the part of the recipients of these samples to the donors thereof. What seems to be a very sensible escape from this impasse has recently been devised by a philanthropic body of doctors who have grouped themselves under the title of "L'Oeuvre d'approvisionnement Médical des Prisons" (A.M.P.). This body, having noticed that prison dispensaries are often short of drugs, while private medical practitioners suffer from a surfeit of them, has devised a system for diverting this surfeit to the prisons. The owners of superfluous samples are requested to send them to a central depôt in the rue Cambacérès in Paris. To facilitate their classification and prescription, they are asked to label them according to the organs or diseases for which their makers intended them. Thus one lot of samples should be labelled "heart and circulation," another "respiratory apparatus," another "rheumatism, gout, diabetes," another "women," another "nerves and aches and pains," another "fevers and infections," another "tonics," and so on. From the humanitarian point of view this scheme seems excellent, and the names of its sponsors are in themselves a guarantee of its philanthropic motive. Whatever individual sceptics may think of the therapeutic value of the average proprietary pharmaceutical preparation, judged by strictly pharmacological standards, it is impossible to overrate the psychic value of "something in a bottle." The prisoner who in the past has been given no remedy for his aches and pains, must have often been tempted to think he was neglected simply because he was a prisoner and not because the prison medicine cupboard was bare.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

SANITATION AND UNEMPLOYMENT.

A COMMITTEE of sanitary engineers representing the sanitary engineering divisions of State public health departments has drawn up a memorandum on the relation of unemployment relief to engineering projects. Investigation has shown that projects for the purification and protection of water-supplies and for the installation and operation of sewerage works are suffering as the result of the depression. The committee points out that such a result is creating a mortgage on the health of future generations. Relief committees handling funds subscribed voluntarily by the general public will wish to use these funds as far as possible to create employment rather than to support families in idleness. What better employment could be found than work which will improve the health and environment of future generations? The committee recommends that surveys be made in the several States of need for "the improvement of water-supplies and distributing systems, works for the collection and disposal of sewage, refuse, garbage, and other municipal wastes, malaria and mosquito control, rural sanitation, and reclamation of waste or wet lands for recreation and other useful purposes."

This memorandum has been adopted by the Conference of State Sanitary Engineers, by the engineering section of the American Public Health Association, and by the Association's governing council.

ENTERIC IN MONTREAL.

As an example of what may happen as a result of relaxing standards of sanitation I may quote a recent report[1] in the devastating epidemic of typhoid fever in Montreal in 1927. It was shown that milk, cream, and ice-cream were the common articles of food in the dietaries of the sick. The preponderance of cases was amongst the young. Cases were scarce or absent in areas not supplied by the Montreal Dairy Company and its associate the National Dairy Company. The milk supplied by these companies was pasteurised milk. The story of how this milk came to be responsible for the most extensive epidemic of typhoid fever recorded in modern times is a story of inadequate supervision and control of the pasteurising plant. The methodical procedure of the investigation and the graphic illustrations of the methods employed constitute a model text of thorough epidemiological research. The investigation is published with the approval of the Director of the Provincial Bureau of Health at Quebec.

SEWAGE IN THE GREAT LAKES.

A plea for more adequate control of sewage and wastes discharged into the Great Lakes is entered by a Cleveland engineer in the *Scientific Monthly*.[2] An important investigation was made in 1913–14 as a result of a treaty between Great Britain and the United States, the scope of the inquiry being to determine "to what extent and by what causes and in what localities have the boundary waters between the United States and Canada been polluted so as to be injurious to public health and unfit for domestic and other uses." This investigation confirmed the work of previous if less important studies that the lakes are dangerously polluted with sewage along shores opposite to large centres of population. Were it not for the irregular diffusion of wastes by surface and sub-surface currents, the natural processes of purification would have a better chance to protect water-supplies. Onshore winds have a tendency to drive surface currents shoreward, and the water returns as an undertow to the body of the lake. Ordinary measures of water purification are insufficient protection against such risks of heavy contamination. Adequate treatment of sewage and trade wastes is called for not only by the above consideration, but also that shore waters used for bathing may be

[1] Pease, H. D.: An investigation of Epidemic Typhoid Fever in Montreal in 1927. Pease Laboratories Inc., New York, 1931.
[2] Ellius, J. W.: Water Purification and Sewage Disposal in the Great Lakes. Scientific Monthly, November, 1931, p. 423.

protected from floating sewage solids and from oils and grease. Even the danger of contamination by passing vessels is not as negligible as it was once believed to be. The entry to the lakes of ships from foreign ports introduces danger of such infection as cholera unless the quarantine regulations and the rules prohibiting discharge of sewage are rigidly enforced.

POLIOMYELITIS AND SERUM.

The appeal, referred to in a former letter,[3] made by the New York State Department of Health for immune blood to be used in the treatment of poliomyelitis has met with remarkable success. Over 1100 persons responded and actually 1011 were bled between July 27th and Oct. 5th. Eighty-seven of these were bled twice and many others volunteered to be bled a second time. The department has now a large reserve list of donors and has been able fully to meet the emergency created by the recent epidemic.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE HOSPITALS SWEEPSTAKES.

THE Hospitals Trust has now passed to its bankers a sum of £1,124,703 for payment of prizes on the Manchester November Handicap. A sum of £739,754 is available for the hospitals. Of this one-third has been paid to the Minister for Local Government and Public Health for distribution to rate-supported institutions. The remainder—a little less than half a million—will be divided among 44 voluntary hospitals in such proportion as the Minister for Justice shall determine after he has received the advice of his committees of reference. Preparations for the next sweepstake—on the Grand National—are already well advanced. Forty-eight voluntary hospitals have been admitted as participants, the newcomers being the Rotunda Hospital, Mercer's Hospital, Cliftonville Convalescent Home, Cork, and St. Patrick's Incurable Hospital, Cork.

It is probable that a suggestion will soon be put forward in concrete form to provide that a certain proportion of the Hospital Fund accruing from future sweepstakes should be allocated to medical research. At present there is no public provision for medical research in Ireland, and attempts to obtain money from various sources have failed. It is pointed out that a small percentage of the Hospital Fund would provide amply for research for the next few years, and might even provide a capital, the income of which, when sweepstakes are no more, would give a subsidy to help research in the future. The Research Fund would presumably be under the control of the Minister for Local Government and Public Health, who should be assisted in its administration by a small council appointed for the purpose.

A NEW CHAIR IN UNIVERSITY COLLEGE, DUBLIN.

The Senate of the National University of Ireland has established a chair of biochemistry and pharmacology in University College, Dublin, and has appointed Dr. Edward J. Conway thereto. Dr. Conway has done important research work in the last few years, dealing mainly with the secretory functions of the kidney. He is a graduate in medicine, and a Doctor of Science, of the National University.

[3] THE LANCET, Sept. 5th, p. 550.

MEDICINE AND THE LAW.

"Osteopathic Physician and Surgeon."

SECTION 40 of the Medical Act makes anyone liable to a fine not exceeding £20 who wilfully and falsely pretends to be or takes or uses the name or title of a physician or surgeon or any name or description implying that he is registered under the Act, or that he is recognised by law as a physician or surgeon. If the magistrate at the Marylebone police-court is right, the section has no terrors for anyone who, in describing himself as physician or surgeon, prefixes the qualifying word "osteopathic." Prof. A. E. Shakesby, a bone-setter and osteopath, practising at Dorset-square, was summoned at that court on Dec. 9th for taking the description "osteopathic physician and surgeon." Mr. Bingley, the magistrate, held that this was not an offence against the section; the defendant had not described himself as a "physician or surgeon" but had merely amplified his profession of bone-setting. A case is to be stated for the opinion of a higher court.

The issue presumably is a question of fact—what would the Profesor's description be taken to mean by an ordinary person? Would it suggest to such a person that the Professor was a duly qualified and registered medical practitioner or would the Professor's description sufficiently make clear that no such claim was made? When the Bengali student writes after his name "failed B.A.," ordinary persons do not understand him to be describing himself as a Bachelor of Arts. It must be in some similarly restrictive sense that Mr. Bingley interprets Prof. Shakesby's description "osteopathic physician and surgeon." Some people may be surprised that a not duly qualified practitioner, who adopts the title "physician and surgeon" in any form or context, fails to realise that he may be creating the impression that he is duly qualified. If a description is ambiguous, it ought not to be used. The whole purpose of the Medical Act is to enable the public to distinguish persons who are duly qualified from persons who are not.

Court Martial Conviction for Dentists Act Offence.

It is odd to find an offence against the Dentists Act being punished by a court-martial. On Dec. 11th, a private in the Army Dental Corps, attached to No. 12 Company, R.A.M.C., was found guilty by a district court-martial at Woolwich of having practised dentistry without being registered in the Dentists Register, and of having converted to his own use a sum of money entrusted to him by another soldier for the purpose of obtaining artificial teeth. The accused was sentenced to 56 days' imprisonment with hard labour and dismissal from the Army with ignominy. A soldier, being also a citizen, is subject to the civil as well as to the military law. A court-martial can try and punish him for offences committed against the ordinary law in England, except for a few grave offences such as treason, murder, manslaughter, and rape.

ENLARGEMENT OF CHESTERFIELD HOSPITAL.—Last week the Duke of Devonshire opened a new ward of 31 beds and other additions to this institution which have cost £22,000. The ward is named after the late Mr. Thomas Murphy, of Chesterfield, who bequeathed £10,000 to the hospital. The buildings include ophthalmic, nose, throat, and ear departments, a theatre, and a laboratory.

CORRESPONDENCE

MEASLES.

To the Editor of THE LANCET.

SIR,—As a medical officer of health I am naturally less interested in the theoretical question as to whether measles has now become a preventable disease by the use of convalescent or adult serum than in the practical application of this method for the mass control of the infection and its mortality. I would remark, however, that since ever we learned how measles propagates itself the disease has in theory been preventable. It has in fact been shown to be capable of some control in isolated rural areas by the simple method of notification and school closure.[1] Unfortunately, as we all know, and as Dr. Forbes has pointed out in your columns, school control has an almost negligible influence upon the volume of epidemics of measles in towns, although until I am absolutely convinced that even a slight retardation of the course of an epidemic has no influence on its virulence, I am not prepared to go as far as he does in abandonment of our present methods.

I am afraid the use of convalescent or adult serum is not going to carry us very much further. We are indebted to Dr. Percy Stocks [2] for his very valuable demonstration of the amount of work which would be entailed in an attempt to modify an epidemic by this means and for his estimate of the influence such measures would be likely to effect. The fact that he is forced back to a somewhat tentative advocacy of the deliberate exposure of children to infection followed by partial immunisation is sufficient evidence to us that even a theorist is conscious of the practical limitations of immunisation. Dr. Forbes in your last issue suggests that the health departments might immunise selected contacts of cases of whom they have obtained information through schools and creches and who constitute a very considerable proportion of all those infected during an epidemic. To handle them alone would require a great increase of professional staff, because it must be clearly understood that health departments have no staff to spare for extra work of this kind during a measles epidemic. Moreover, even if we did temporarily expand our departments to deal with these children, we know that in towns another huge body of children would be exposed to infection at random, and what we might do for contacts would have relatively little influence on the incidence or mortality of measles among them. I say nothing of the difficulty likely to be encountered in persuading parents to adopt a method which does not offer complete protection but merely modification; and I take it that complete immunisation is not advocated as desirable for the general body of the working-class population. As a method of dealing with measles in the mass I do not think that immunisation will be of practical value for a very long time.

It seems to me, therefore, that medical officers of health can do very little more at the present time than advocate the use of human serum in institutions within their area and take steps to see that the public are aware that such a method exists. The slow progress of the practice of immunisation against diphtheria and scarlet fever because of the prejudice of the public against all forms of treatment or prophylaxis which involve puncture of their skin is evidence that immunisation against measles, which is really in practice a much more difficult and complicated affair, holds out little immediate prospect of controlling epidemics of the disease, and not much of reducing its mortality. If it is to be at all successful it must be through the efforts of the family practitioner whose interest in the matter it is to be hoped your frequent references to the subject will arouse.

I am, Sir, yours faithfully,

RALPH M. F. PICKEN.

Public Health Department, City Hall, Cardiff,
Dec. 14th, 1931.

[1] THE LANCET, 1921, i., 1349.
[2] Brit. Med. Jour., Nov. 28th, p. 977.

SURGICAL ASPECT OF BIRTH CONTROL.

To the Editor of THE LANCET.

SIR,—In view of the public interest in family limitation that has recently been awakened by prominent members of the Church and Bench, it may reasonably be considered part of our duty to restate certain relevant medical and surgical facts which appear to be overlooked by the laity, however obvious they may be to members of our profession and to gynæcologists in particular. To whatever extent we may sympathise with the general objects of Mr. Justice McCardie's observations, we have to recognise:

(1) That there is unfortunately available at the present time no contraceptive method that is at once absolutely reliable, fool-proof, and free from risk. I exclude abstinence and coitus interruptus as unphysiological and harmful.

(2) That, contrary to public opinion as frequently expressed, the artificial termination of pregnancy involves very considerable risk even under the best circumstances. What the laity is often pleased to consider a simple curettage may prove to be a very difficult and dangerous procedure.

(3) That the surgical sterilisation of women, whether mentally defective or otherwise, involves the inevitable risks of laparotomy.

At the further risk of labouring the obvious, I therefore contend that, quite apart from ethical considerations, reputable surgeons will continue to be prohibited by their *surgical* conscience from undertaking these latter procedures in the absence of pathological indications. Whether the Church and Bench approve or disapprove is immaterial. If an enlightened Bench proposes to dictate active measures to more compliant members of our profession the risks to life will be correspondingly increased. So far as pathological indications for sterilisation or the termination of pregnancy are concerned, it is well known that the law affords us no guide or assistance whatever. The whole onus is ours.

Sterilisation by means of X rays or radium is outside the scope of my present argument. These measures imply physiological impairment of an individual already presumably defective, rather than any risk to life. This aspect of the problem is essentially ethical, and concerns the relative interests of the individual and the community. For my own part I sincerely hope that there will become available in the near future procedures whereby pregnancy can be prevented or terminated without the slightest risk to life or physiological well-being. But in the meantime we must insist upon the surgical point of view.

I am, Sir, yours faithfully,

Harley-street, W., Dec. 14th, 1931. FRANK COOK.

EPIDEMIC POLIOMYELITIS.

To the Editor of THE LANCET.

SIR,—This letter is prompted by the most interesting article by Mr. Scott Brown, and your instructive leader, taken in conjunction with experiences in Australia described to me by Dr. Jean Macnamara. The latter are so hopeful and so illuminating that I cannot refrain from a very brief reference to the matter (pending her full publication). For poliomyelitis can be the most cruel of all diseases and we in England must not be caught napping—leaving diagnosis until paralysis has occurred, and without convalescent serum in sealed ampoules ready in every town. It is clear, then :

(1) That early diagnosis—i.e., before paralysis—is possible in an epidemic. It depends on the alertness of parent and doctor to suspect the disease, and upon the doctor making the two vital investigations : (*a*) into the existence of any erector spinæ spasm ("spinal sign"); (*b*) of the C.S.F. by lumbar puncture and *immediate* cell count, &c.

(2) That convalescent serum, intrathecal and intravenous, given before paralysis prevents or minimises it. But there is no time to be lost; paralysis may commence in minutes or hours. The task of diagnosis and treatment by convalescent serum is as urgent as that of a "ruptured ectopic."

(3) That contacts can be protected.

As an instance of what can be done in an epidemic Dr. Macnamara told me that of the last twelve cases admitted to a children's hospital, ten were in the pre-paralytic stage. It is true that, *apart from* an epidemic, pre-paralytic diagnosis must remain a difficult achievement. But if doctors, whenever they are dealing with the early stages of a "pyrexia of uncertain origin," will remember the possibility, and watch for the "spinal sign," then promptly bring a pathologist, complete with a syringe, microscope, and serum, to the bedside, many a patient will be saved.

One other point in support of your recommendation as to early splintage. Ten years ago I said that orthopædic treatment could do more in the first two days of the paralysis than in the ensuing two years. This indeed holds good, and we should put the muscles at rest by complete, comfortable, and undisturbed covering and splintage of the whole body, and so enable the sick and aching cells to sleep undisturbed by telephone calls from cortex and skin. Undoubtedly this enables many a poisoned cell to recover. But prevention is far better.

I am, Sir, yours faithfully,

G. R. GIRDLESTONE.

Headington, Oxford, Dec. 14th, 1931.

COMPILATION OF HUMAN PEDIGREES.

To the Editor of THE LANCET.

SIR,—I have followed the correspondence on this subject and warmly support Mr. C. J. Bond's suggestion to initiate a section for the study of human hereditary diseases at the Royal Society of Medicine. Surely this would be the best centre for stimulating interest in a subject which is greatly neglected by our medical profession. How great is the lack of reliable pedigrees and data for study has been recently brought home to me in trying to trace the hereditary element in diabetes. At present insufficient information is available to enable us to give a rational answer to a diabetic who asks whether his child is likely to be diabetic; and such information will remain lacking until general medical interest is stimulated to study and record their patients' pedigrees.

I am sure that many Fellows of the Royal Society of Medicine would welcome the formation of a special section and would give it their warm support. The interest of practically every branch of medicine and surgery is involved in this subject.

I am, Sir, yours faithfully,

R. D. LAWRENCE.

Harley-street, W., Dec. 13th, 1931.

THE LATE SIR DAVID BRUCE.

To the Editor of THE LANCET.

SIR,—My first recollection of the late Sir David Bruce takes me back to the old infirmary of Edinburgh. Mr. Chiene, the junior surgeon, but even then thought the best surgical teacher, saying "I have some of the best students of the school in my wards," our eyes turned to J. Lockhart Gibson (first-class honours, and when he went back to Australia he discovered the cause of, and stopped, the optic neuritis of children that was becoming endemic) and the imposing Bruce. Bruce later found practice distasteful, married his chief's daughter (of an artistic family, her first cousin, General Sir Walter Bedford designed the badge of the R.A.M.C., and her sister designed that of the Order of Merit), joined the R.A.M.C., and brought the lady to the Students' Club Ball of 1884–85 in Edinburgh. I found them at Malta in 1886–89, when I was serving in H.M.S. *Alexandra* flagship in the Mediterranean, and on March 8th, 1886, noted in a diary Bruce's magnificent appearance at the fancy dress ball at the Palace (white tie-wig, waistcoat, stockings and shoes, with a pink satin coat and breeches). Next year he had isolated from his many fever cases at Valetta Hospital a micrococcus which seemed to be the cause of Malta fever, which was distinctly a trial to us. In those days we knew few "germs." I was very pleased another had been found by the army, and boasted of this in our mess. "But what good is that," they said, "it doesn't help you to cure us." Not that that really mattered to my immediate associates, for in three years we had no case of undulant fever in our mess of 25. The admiral got it and our messman, and our first senior surgeon got it, but after he had left us on promotion to the *Thunderer*. He has, alas! died, so I cannot find out how he became infected; we did not have porridge and milk at breakfast then, as became the practice later. Our naval instructor told me the fever was spread by the hospital, but of course I was not going to believe that, and had no idea the pyrexia on board us was different from that in the army, as it was. A. G. P. Gipps, surgeon in *Dreadnought*, and I each wrote papers for the Epidemiological Society, he proving the cause of fever was in the harbour water, and I in faulty ventilation. I suppose we had hardly one case of brucella infection in our minds. Gipps got a bacteriological equipment out of the then Medical Director-General, but, unable to fit it up anywhere for himself, had a nook found for him in Valetta Hospital by Bruce. This discovery by Bruce bore little fruit until Sir Almroth Wright showed how to use the micrococcus in diagnosis, along the lines of the Widal reaction. Cases of brucella infection could then be accurately separated from the others occurring, and in 1897 "Mediterranean fever" became an official diagnosis in the navy. Once these cases could be distinguished, prevention was above the horizon, and a commission was set to work with

Bruce, now a renowned investigator, at its head. A goat's blood was found to react; Bruce at once appreciated how important this was and urged further examinations. Others found the micrococcus in goat's milk; this was forbidden to be used, and Mediterranean fever cases, 270 in the navy on the station in 1905, dropped in 1907 to 14, and the army found it could spare six of its medical officers from Malta for India. The disease could not yet in fact be cured. What was far more important, and not at first even imagined, it could be and was prevented. As Lady Bruce pointed out to me later, without that prevention Malta could not have been used in the late war as a hospital base for cases from Gallipoli.

And so the harvest came at last, after 20 years. In 1887, the cause found; in 1897, its clinical use developed; thereby in 1907 the disease stopped. Rarely has a man to wait 20 years for the harvest of his sowing, and then himself reaped it. It was a great research as it proved, though Koch rather made little of it as concerned with only a small island; but how the endemic area is being extended from year to year, even into the Eastern Black Sea, whence it may have been introduced into Malta at the time of the Crimean War, as seems possible from Surgeon Captain Dudley's Croonian lectures this year (THE LANCET, 1931, i., 684). This history should encourage all junior officers who may in future be disappointed when they find that some knowledge they have toilsomely acquired fails to secure immediate recognition from the physicians of their time.

I am, Sir, yours faithfully,

W. E. HOME,
Fleet Surgeon.

Southborough, Dec. 5th, 1931.

TICK-BITE FEVER.

To the Editor of THE LANCET.

SIR,—Drs. Troup and Pijper in their paper on Tick-bite Fever in Southern Africa (Nov. 28th, p. 1183) note the occurrence of a relative lymphocytosis without increase in the total number of white cells. W. and L. Haberfelt (*Wien. klin. Woch.*, 1914, p. 149) have reported similar changes in tick-bite fever in Brazil. They noticed the enlargement and tenderness of the regional lymph glands. The blood count in an illustrative case was 7200 total white cells with 62 per cent. lymphocytes. The percentage of lymphocytes fell in two to four weeks to about 40 per cent. at which it remained, this figure apparently being normal for the district. A short time ago I tried to find if these results had been confirmed or repeated, but did not discover any subsequent reference to investigations on the subject.

I am, Sir, yours faithfully,

H. LETHEBY TIDY.

Devonshire-place, W., Dec. 11th, 1931.

SERUM TREATMENT OF PLAGUE.

To the Editor of THE LANCET.

SIR,—I am grateful to Dr. Naidu and Colonel Mackie for their generous appreciation of my work.[1] The early history of the serum therapy of plague was summarised by Dr. Naidu last year[2]; there are a few points I should like to record here.

Lustig's serum was made at Bombay (1899–1901) by the colleagues of Prof. Lustig and applied fresh to the patients at the Arthur Road Hospital. Whilst it exerted appreciable influence upon the course and fatality of bubonic plague in a small number of cases, the majority succumbed. It was thereupon that my colleagues Berestneff of Moscow and Alfons Mayr undertook to examine the blood. We soon found the key to the heavy mortality, to wit—infection of the blood by the *B. pestis*. The cases were therefore divided into four classes according to the absence or presence of septicæmia, −, +, ++, +++, respectively, a procedure that was subsequently confirmed and adopted by the Plague Research Commission (1907–1910). It was noticed that all ++ and +++ cases invariably died and there were very few recoveries from those with +. Almost all who recovered belonged to − group. Moreover, 60 to 70 per cent. of admissions fell under the septicæmia groups of which ++ and +++ formed the great majority. This then was the explanation of the heavy mortality. All these patients were admitted at a late stage of the disease and belonged to the labouring and poorer classes. The Municipal Corporation and the Bombay Government, who jointly contributed to the expense of the laboratory, stopped further preparation of the serum as the results were obviously not proportionate to the outlay. The experience of the work extending almost over four years was thus lost. It was represented to them that further researches were necessary though on a smaller scale. Had that been done, I am confident that we should not have had to wait for over a quarter of a century for the preparation of a more potent serum. Lustig's serum however showed better results (in twelve-hourly subcutaneous injections of 40–60 c.cm.) in private practice, as patients belonged to a superior stratum of society, and came under observation on the first or second day of illness. That was indeed encouraging. Thereafter Yersin's serum from the Pasteur Institute, the only one available, was used at my hospitals and at other places in this Presidency with good results in the above type.

When Sir Charles Martin arrived in Bombay (1907) with the Plague Research Commission I laid before him the record of my work; he thereupon secured the permission of the Government of India to enable the Commission to inquire into the serum treatment. In spite however of the combined intravenous and subcutaneous methods, the results did not differ materially from those I had obtained in the earlier trials. And finally, the Advisory Committee on Plague Investigation in India reported in 1913, as narrated by Naidu and Mackie in the third para. of their paper. Undeterred by that adverse report, I continued to use Yersin's serum in private practice whereby the average recovery-rate, in sterile cases treated on the first day of illness, came to over 80 per cent. as compared to 25 to 30 per cent. in hospital practice.

As plague continued to prevail throughout India, I made an earnest appeal (1923) to the Government of India to undertake further research, and was agreeably surprised to learn that the Indian Research Fund Association were to finance further investigation. The first-fruits of this work are now available in the valuable contribution of Naidu and Mackie. It is a landmark of advance and holds out the promise that within a short time we shall be possessed of a serum that will control the septicæmia of bubonic plague.

There are certain advantages in the early treatment of plague with serum. The course of illness is reduced almost by half if treatment is begun on the first day. The temperature returns to normal on the

[1] THE LANCET, Oct. 24th, p. 893.
[2] Ind. Jour. of Med. Res., 1930, xvii., 1259.

fourth day as against eight to ten days in untreated cases. Moreover buboes invariably resolve; when serum is given on the second day, half the cases suppurate and thereafter there is no difference in this regard. There are, however, certain drawbacks inseparable from the use of serum So-called serum disease prolongs convalescence and has to be set off against the rapid neutralisation of the toxins. Vegetarians almost entirely escape its manifestations. Parsees and Mahommedans, who are non-vegetarians, suffer in a certain proportion, Europeans most of all. Acute anaphylaxis has been observed whilst the serum is actually running into the vein; coryza, lacrymation, pyrosis, and urticarial wheals. In other cases, severe rigors supervene a few hours after intravenous injection of even 50 c.cm., followed by high temperature with cardiac distress and weakness. The temperature falls gradually in a few hours, and all the graver symptoms disappear. Death but rarely occurs.

I am, Sir, yours faithfully.

Bombay, Nov. 26th, 1931. N. H. CHOKSY.

HIGH HEELS.

To the Editor of THE LANCET.

SIR,—Mr. Roth says that high heels do not project the weight of the body to the fore part of the foot to a greater extent than low heels. This is the crux of the matter. I admit that, when standing still, the weight distribution is not disturbed, but, when walking, I say that high heels do project the weight to the fore part of the foot. Observation during the period of short skirts has repeatedly shown me that when walking in high heels, women hold their knee-joints flexed about 15 per cent. permanently. This means that the tibia is inclined in a more forward direction than normal, and, on Mr. Roth's own admission, it follows that the weight of the body will be distributed to a greater extent to the fore part of the foot. Only if very minute mincing steps are taken can the knees be fully extended. Incidently, it will also be found that if anybody tries to walk extra fast he will find himself keeping his knee-joints slightly flexed and his body inclined forward. It is not therefore surprising that a woman won a walking race in high heels. A mathematical calculation could doubtless be made showing the exact difference of weight distribution consequent on this flexion of the knee-joint. Statistical evidence could also be obtained from any out-patient department. Take 200 men and 200 women consecutively and enumerate the numbers of cases of fallen metatarsal arches. I wager the greater number will occur among the women—that is, among the wearers of high heels. It may well be that women, who do a lot of standing, find that high heels relieve the strain on the instep, but, unless they change into low heels for walking, the relief is purchased at the cost of fallen metatarsal arches.

Mr. Trethowan taught me that the way to prevent flat-foot was to throw the weight of the body to the outer aspect of the feet by walking with the feet straight or even slightly turned in, and, if necessary, by raising the inner border of the sole and heel. That this is the right method my experience in general practice and in an infantry regiment for three years has proved to my satisfaction. Women have told me that they have found flat heels not less but more comfortable and that they can walk miles in them, whereas before they could not do so. Nevertheless, I admit that the human body was not constructed for long continued standing, and useful work could be done in driving this fact home to the public, and so preventing the prolonged standing, usually quite unnecessary, that some occupations demand from pure force of custom.

I am, Sir, yours faithfully,

Bridlington, Dec. 15th, 1931. P. D. H. CHAPMAN.

"DUPLEX THERAPY."

To the Editor of THE LANCET.

SIR,—In your last issue (p. 1333) I noted with interest the report on Mr. G. G. Blake's lecture delivered before the Royal Society of Arts on what he terms "duplex therapy." By this he means the simultaneous applications of diathermy currents with some other current employed in electrotherapy. Reading the résumé of his address, one is given the impression that Mr. Blake is unaware of the fact that the filtering device, which he makes use of and which he praises, has been used for some time by the medical profession to superpose other currents on high-frequency currents. Not knowing exactly at what moment Mr. Blake evolved his apparatus, I might do him an injustice by claiming that I applied the same circuit to medical electricity before him, but I wish to point out that at my suggestion a British firm constructed a diathermy machine incorporating the necessary chokes and condensers well over a year ago. This, after I had experimented and had satisfied myself of the value of combining diathermy with other currents. It is regrettable that Mr. Blake should not have acquainted himself with the literature available on the subject or even perused an electro-medical apparatus manufacturer's catalogue before alluding to his apparatus as a new contribution to medical science. The "contactometer" which he demonstrated, and the importance of which was grossly overrated by the lay audience, was certainly a most ingenious if elaborate piece of apparatus. It is, however, worthy of note that although thousands of diathermy treatments on eyes have been carried out by myself and my assistants, not once would the apparatus have had an opportunity of cutting off the current, to exhibit the importance with which it was invested by the lecturer. For, as your reporter justly remarks, "damage would already be done when the contactometer gave evidence of it," and as he further suggests, correct technique should preclude any possibility of accidents happening. I fear I cannot however agree with his conclusion as to "the need for the physicist interested in biology in the investigation of problems that confront the practitioner of physical medicine." The need is a sound knowledge of physics in the practitioner of physical medicine. I am, Sir, yours faithfully,

Wimpole-street, W., Dec. 15th, 1931. PH. BAUWENS.

DONATIONS AND BEQUESTS.—Among other bequests the late Mrs. Rose Ray Coyne Goldberg, of Grosvenor House, Park-lane, W., left £2000 to the Hospital for Sick Children, Great Ormond-street, for cots to be known as the "Arthur Hilton Greaves" and "The Ray Greaves" cots; £1000 each to the Royal Hospital for Incurables, Putney, the Hospital for Consumption, Brompton, Guy's Hospital, St. Thomas's Hospital, and the London Hospital; and the ultimate residue of the property equally between the last-named five hospitals.—The late Lady Battersea left, in addition to many private and personal bequests, £10,000 between the Cromer Hospital, the Metropolitan Hospital, Kingsland-road, the Jewish Association for the Protection of Girls and Women, and the Jewish Board of Guardians, and £1000 to the Metropolitan Hospital Convalescent Home.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

CHRISTMAS ADJOURNMENT.

BOTH Houses of Parliament adjourned on Friday, Dec. 11th, for the Christmas recess. They will reassemble on Feb. 2nd.

In the House of Lords on Wednesday, Dec. 9th, the Veterinary Surgeons (Irish Free State Agreement) Bill was read a second time. On Friday, Dec. 11th, the Royal Assent was given to the STATUTE OF WESTMINSTER ACT, the NATIONAL HEALTH INSURANCE (PROLONGATION OF INSURANCE) ACT, and the HORTICULTURAL PRODUCTS (EMERGENCY CUSTOMS DUTIES) ACT.

The TOWN AND COUNTRY PLANNING ACT was introduced into the House of Commons on Thursday, Dec. 10th, by Sir E. HILTON YOUNG (Minister of Health), and was read a first time. This Bill authorises the making of schemes with respect to the development and planning of land, whether urban or rural, and in that connexion to repeal and re-enact, with amendments, the enactments relating to town planning; to provide for the protection of rural amenities and the preservation of buildings and other objects of interest or beauty, and for charging on owners of property expenditure on improvements within areas to which schemes apply; to facilitate the acquisition of land for garden cities; and to make other provision in connexion with the matters aforesaid.

HOUSE OF COMMONS.

WEDNESDAY, DEC. 9TH.

Pedestrians Killed by Motor Vehicles.

Dr. SALTER asked the Home Secretary how the number of fatal accidents caused to pedestrians by motor vehicles in the Metropolitan area in the first nine months of this year compared with the number in the corresponding period of 1930; and what was the number of pedestrians killed on the footway by motor vehicles mounting the pavement during the first nine months of 1931 and during 1929 and 1930, respectively.—Sir H. SAMUEL replied: The number of pedestrians fatally injured in the first nine months of 1931 was 601, as compared with 547 in the corresponding period in 1930. The number of pedestrians fatally injured by motor vehicles mounting the pavement was 20 in the first nine months of 1931; the figures for the corresponding period of 1930 was 15, and for 1929 was 21.

THURSDAY, DEC. 10TH.

Future of Royal Veterinary College.

Lieut.-Colonel FREMANTLE asked the Minister of Agriculture if any decision had been made regarding the proposed grant for the rebuilding of the Royal Veterinary College as essential for the existence of veterinary training and research; and if he was aware that it was largely on the prospect of a Government grant that the appeal of the College for the support of private individuals was made.—Sir JOHN GILMOUR replied: I am unable for the present to add anything to the statement regarding this grant made on page 7 of the White Paper on Reductions in National Expenditure. I am aware of the circumstance mentioned in the latter part of the question.

Lieut.-Colonel FREMANTLE: Does my right hon. friend realise that if the grant is stopped it will stop the research which is the basis of economy of a service which needs it very seriously?

Sir J. GILMOUR: I am aware of the necessity for economy, and I entertain hopes that some progress may be made.

Veterinary Research.

Lieut.-Colonel FREMANTLE asked the Minister of Agriculture whether the preparation of a scheme for the development and coördination of veterinary medical research had been completed, and when it was proposed that the scheme should be put into operation.—Sir J. GILMOUR replied: My department has formulated proposals for the purpose stated which are now under discussion with the Agricultural Research Council; but I feel I must make it quite clear that any scheme finally settled can only be put into operation as and when financial circumstances permit.

The Calmette Vaccine.

Sir FRANK SANDERSON asked the Home Secretary whether he had granted a licence under the Cruelty to Animals Act, 39 and 40 Vic., to any experimenter in this country to conduct experiments upon animals with the Calmette or B C G vaccine.—Sir HERBERT SAMUEL replied: Any licence accompanied by Certificate A, with some exceptions, would permit experiments of this character. I understand that some research work on the subject has been done in this country.

Imports of Foreign Milk.

The Duchess of ATHOLL asked the Minister of Health whether he was prepared to lay down a standard of hygienic quality to which condensed and dried milk imported into this country must conform.—Sir E. HILTON YOUNG replied: On the information before me I do not think it is necessary to lay down such a standard.

Lieut.-Colonel FREMANTLE: Is it not possible to have some system by which our consuls will be able to give some kind of report on the conditions under which these articles are prepared, as that is the only way in which their purity can be ensured?

Sir E. HILTON YOUNG: The House will understand in connexion with this and similar matters that the law provides the Minister of Health with power to investigate the conditions of such foodstuffs on arrival, and that power is exercised in such a manner as to check the product.

Lieut.-Colonel FREMANTLE: Does not my right hon. friend recognise that that does not give security?

No further answer was given.

The Duchess of ATHOLL asked the Minister of Health if, seeing that machine-skimmed imported milk was not required to contain any standard quantity of butter fat, as in the case of home-produced milk, he would consider imposing on imported skimmed milk the same conditions as were imposed on the home product.—Sir E. HILTON YOUNG replied: The noble lady's question may be based on a misapprehension. There is no prescribed standard of butter fat for skimmed milk, whether home-produced or imported. This article purports to be as nearly as possible free from butter fat, and it would accordingly be impracticable to impose such a standard.

Sir NICHOLAS GRATTAN-DOYLE asked the Minister of Agriculture whether his attention had been called to the prospect of imports of fresh milk from Norway to the Tyne; what was the destination of the 1300 gallons which arrived at Newcastle on Dec. 7th; whether there was any known scarcity of milk in this country; and what steps he proposed to take.—Sir J. GILMOUR replied: Yes, Sir, my attention has been called to this matter. According to the press, the milk from Norway which was at Newcastle on Dec. 7th was consigned to a firm at Melton Mowbray. As regards the last part of the question, it is the case that there has recently been an abnormal temporary shortage of liquid milk available to the public in this country, but the situation does not, in my opinion, call for any action of an emergency nature in anticipation of any considered measures that I may submit in due course for dealing with agriculture generally.

Mr. GLOSSOP asked the Minister of Health whether he was aware that under the existing regulations governing the importation of foreign liquid milk such milk might contain *Bacillus coli*; and whether, in the interest of public health, he would take the necessary steps to have the regulations amended.—Sir E. HILTON YOUNG replied: The Public Health (Imported Milk) Regulations do not impose any conditions as to *Bacillus coli* in imported milk, but the regulations require that imported milk shall conform to a strict bacteriological standard of purity which is not required in the case of milk produced in this country other than graded milks. I do not think that it is necessary to amend the regulations as suggested.

Russian Butter and Public Health.

Major-General Sir A. KNOX asked the Minister of Health if his attention had been drawn to an article in the official Russian newspaper, *Pravda*, of July 10th, regarding the unhygienic conditions of milk production in the large Soviet farm, Molochnoye; and whether, in view of the outbreak of disease at Yeovil last week which the doctors attributed to contaminated butter, he would consider the prohibition of the import of butter from the Union of Soviet Socialist Republics.

Mr. DONNER asked the Minister of Health whether he was aware that the Moscow state inspection department (Gosinspekstia) had officially admitted that increasing quantities of Russian export butter were insanitary and damaging to health; and, in view of this, what steps he was prepared to take to prevent the importation into this

country of Russian butter.—Sir E. HILTON YOUNG replied: My attention has been called to reports of the statements in question. I am not aware of any outbreak of illness at Yeovil attributed to the consumption of butter. I have received information of several cases of illness in a neighbouring district, in connexion with which a number of samples of butter were examined, but these were all found to be free from microbic contamination. Russian butter with other foods is subject to examination at the ports, and there is no evidence at present before me on which I should be justified in taking any steps to prohibit its importation.

Asbestosis.

Mr. JOHN JONES asked the Home Secretary the number of workpeople engaged in the asbestos industry who had been examined by members of the medical board; the number of workpeople found to be suffering from asbestosis; and the number of workpeople suspended from work in the industry by the medical board.—Sir H. SAMUEL replied: 582 workers have been so far examined by the Board; three have been found to be suffering from asbestosis, of whom one has been certified to be totally disabled, and two have been suspended. In addition, one worker has been suspended on account of tuberculosis, and one on account of defective physique, making a total of four workers who have been suspended. In 77 of the cases examined the Board are awaiting the result of a radiological examination, and have come to no conclusion.

Shops Act Regulations and Chemists Supplies.

Mr. GOLDIE asked the Home Secretary whether he was aware that the sale of safety-razor blades at chemists' shops in Central London was prohibited on Saturday afternoons while the sale of tooth-brushes was permitted; and whether he would introduce amending legislation in the interests of retail shopkeepers and the public generally.—Sir HERBERT SAMUEL replied: Shops are required by the Shops Act, 1912, to close for a weekly half-holiday, but an exemption is provided for the sale of medicines and medical and surgical appliances, and I understand that, though there has been no legal decision, the chemists in Central London treat tooth-brushes as covered by this exemption. Wherever there is legislation dealing with such a matter as a weekly half-holiday for shops, some special exceptions must be permitted, and wherever there are exceptions there must be border-line cases. Any amending legislation would involve either the surrender of the half-holiday or else border-line cases of a different character but presenting similar anomalies.

Sewerage Schemes in Greater London.

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health the number of sewerage schemes necessitated by the extension of residential and industrial development in the districts immediately outside the Metropolitan area which his Department had sanctioned in the last three years; whether he was aware that dissatisfaction existed as to the delay in sanctioning such schemes; and what action he proposed to take to remove the cause of complaint.—Sir E. HILTON YOUNG replied: During the past three years loans for 306 schemes of sewerage and sewage disposal have been sanctioned by my Department for districts within 25 miles of Charing Cross and outside the Metropolitan area. These schemes have, in large measure, been necessitated by residential and industrial development. Their estimated cost was over £3,700,000. The answer to the second part of the question is in the negative, and as regards the last part I shall be glad to be furnished with any instances of alleged delay.

Dental Practitioners and Panel Patients.

Mr. RHYS DAVIES asked the Minister of Health if he would prohibit dental practitioners, who had accepted the official scale of payments agreed upon, inducing insured persons entitled to service under that scale to contract out of the arrangement by representing that private treatment for higher fees was more satisfactory than the official dental service provided under the recognised scheme.—Sir E. HILTON YOUNG replied: I think that the matter to which the hon. Member directs attention is already adequately covered by the Dental Benefit Regulations. Those Regulations provide that a dentist shall apply the same degree of skill and attention when giving treatment to an insured person under the Regulations as he would apply in giving treatment to a private patient. A dentist is not, however, required to enter into any general undertaking to provide treatment on the terms and conditions laid down in the Regulations to all insured persons who are entitled to dental benefit and who apply to him for treatment. Every such person is the subject of a separate contract, and the dentist is free either to accept or to decline the insured person as a patient under the conditions laid down in the Regulations. In the former event he is expressly debarred from suggesting, demanding, or accepting any payment from the insured person beyond that provided in the prescribed scale, and the insured person is entitled to receive from his approved society the proper proportion of the cost of his treatment. In the latter event it is impossible to prohibit the insured person from agreeing with the dentist to be treated as a private patient at such fee as may be mutually agreed between them, but in that case the insured person would not be entitled to claim any part of the cost of his treatment from his approved society.

Local Government Act, 1929.

Lieut.-Colonel ACLAND-TROYTE asked the Minister of Health how many local authorities had forwarded resolutions to him proposing that the review of county districts under the Local Government Act, 1929, should be postponed for three years in the interest of economy.—Sir E. HILTON YOUNG replied: I have received resolutions that the review of county districts should be postponed from 59 urban and 124 rural district councils.

Need of More Mental Hospital Accommodation.

Dr. J. H. WILLIAMS asked the Minister of Health whether he was aware that the cost of a single bed in an asylum, including building and administrative expenditure, amounted to £500 per annum; that the number of asylum inmates increased by over 2000 annually while the recovery-rate remained stationary; and whether, in the interests of economy, he would take steps to secure that preventive measures should be adopted at an early stage by the provision of suitable and inexpensive hostels, run by the local authorities and unconnected with lunacy, for such slight and temporary cases as did not require detention.—Sir E. HILTON YOUNG replied: The initial cost of providing a bed in a mental hospital may be estimated at £500 at present, but the annual cost of maintaining it is about £70. The hon. Member's suggestion is impracticable, because the adequate preventive treatment of incipient cases requires resources of staff and equipment which could not be provided in inexpensive hostels.

FRIDAY, DEC. 11TH.

Reports of Medical Officers of Health.

Mr. GROVES asked the Minister of Health whether the annual reports of medical officers of health were public documents; whether members of the public had a right to see them on demand; and whether there were any rules or regulations in existence governing this matter.—Sir E. HILTON YOUNG replied: There are no regulations regarding the publication of these reports, and the question is one for the decision of the local authority concerned.

THE SERVICES

ROYAL NAVAL VOLUNTEER RESERVE.

Probv. Surg. Sub-Lts. to be Surg. Sub-Lts.: A. C. Howard, J. P. Blaiklock, E. G. Brewis, and G. J. Murray.

ROYAL ARMY MEDICAL CORPS.

Capt. W. A. R. Ross, from the secd. list, is restd. to the estabt.

Lt. E. M. Hennessy to be Capt.

E. K. Malone to be Lt. (on prob.).

TERRITORIAL ARMY.

Capt. G. G. Marshall to be Maj.

Lt. A. T. Ashcroft to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt. H. W. Walter resigns his commn.

ROYAL AIR FORCE.

Flying Officer W. J. Cotter is promoted to the rank of Flight Lt.

AUXILIARY AIR FORCE.

No. 600 (City of London) (Bomber) Squadron: Flight Lt. N. P. Henderson relinquishes his commission on completion of service.

ENLARGEMENT OF BECCLES HOSPITAL.—The Mayor of Beccles last week opened extensions of this war memorial hospital. The additions include a large waiting-room—to take the place of one which was so small that it has been converted into cupboards—better accommodation for radiant heat treatment, a massage room, an X ray room with the necessary appendages, and a recovery room.

MEDICAL NEWS

Royal College of Surgeons of England.

At a meeting of the Council on Dec. 10th, with Lord Moynihan, the President, in the chair, the following were admitted to the Fellowship:—

Herbert Elwin Harris, M.B. Camb.; Charles Skinner Hallpike, M.B. Lond.; Edward Jacobson, L.R.C.P.; Diana Jean Kinloch Beck, M.B. Lond.; Gertrude Mary Beatrice Morgan, M.D. Camb.; Charles Langley Owen, M.B. Camb.; Otto Hooper, M.B. Oxf.; Evan Stanley Evans, L.R.C.P.; John Kirkpatrick Monro, M.B. Camb.; Hugh Elwyn James, M.B. Lond.; Arthur Bernard Pain, M.B. Leeds; Ronald William Raven, L.R.C.P.; Ahmed El Sayed Handousa, L.R.C.P.; Guy Simonds Storrs, L.R.C.P.; James Charles Frederick Lloyd Williamson, L.R.C.P.; Trevor Hellier Berrill, M.B. Bristol; Edward Clive Barber Butler, M.B. Lond.; John Barnard Blaikley, L.R.C.P.; Benjamin William Ryeroft, M.D. St. And.; Sankta Narain Mathur, M.B. Lucknow; Alexander Michael Boyd, M.B. Lond.; Vadankan Hariharan, M.B. Madras; Alan Seymour Philps, L.R.C.P.; Norman Cecil Tanner, M.B. Brist.; Flora Hargreaves, M.B. Lond.; Thomas Henry Wilson, M.B. Lond.; Philip Vernon Reading, M.B. Lond.; Peter Byers Ascroft, M.B. Lond.; Margaret Moore White, M.B. Lond.; Henry Anthony Phillips, M.D. Melb.; Herbert George Letcher, M.B. Adelaide; Denis Smith Poole Wilson, M.B. Dubl.; Harold Alfred Body, M.D. Melb.; Dhanjishaw Dorabjii Boovariwala, M.B. Bomb.; Sorabji Burjorji Cooper, M.B. Bomb.; Alexander Cruickshank, M.B. Aberd.; Rangi Lal, M.B. Lucknow; David Matthew, Mitchell, M.B. N.Z.; Douglas Harold Mitchell, M.B. Melb.; Lindsay Morgan Park, M.B. N.Z.; Eric Evan Price, M.D. Melb.; Lindsay Sangster Rogers, M.B. N.Z.; Thomas Osler Sayle, M.B. Melb.; Hugh Hedley Skeoch, M.B. Sydney; Victor Solomon Stone, M.B. Melb.; and Fauset Welsh, M.B. Birm.

The Diploma of Membership was granted to Eric Allister Knappett (University College), and the Licence in Dental Surgery to the following:—

F. H. Beauchamp, F. C. Blaaberg, R. W. F. Brotherton, G. B. Brummitt, Edward Burn, F. W. Clare, Stanley Clompus, J. E. Darlow, E. R. Dowland, W. A. Duly, H. G. Earnshaw, A. F. Edmonds, J. C. Edmondson, A. J. Evans, W. G. Finnie, A. T. G. Garnett, R. J. G. Grewcock, J. T. Holford, J. N. Holman, J. B. L. Holzer, E. F. Hopson, J. H. Hovell, C. L. Hudson, W. L. Jackson, J. C. B. Jones, C. V. Kark, N. H. Knowles, Ronald Lawton, E. G. W. Lewis, J. G. Lucas, H. R. Mandviwalla, P. A. Mertz, L. R. Millership, Henry Milligan, H. C. Morgan, Ellen J. R. Nichols, A. C. Pani, A. W. Quinton, D. J. Rees, J. G. Richardson, J. A. Robinson, Bangalore Sampath, W. G. Sandison, Veerasekaram Sinnetamby, N. H. Smith, F. A. Soper, Margaret Storey, C. G. Tarry, R. A. Thatcher, Edward Tribe, A. McD. Watson, V. H. Weeks, W. M. Wellings, S. M. Whitteridge, F. R. McN. Willis, and Eric Wood.

Mr. E. Rock Carling, Mr. A. E. Webb-Johnson, and Mr. Claude H. S. Frankau, were re-elected Members of the Court of Examiners. Sir John Rose Bradford, was elected a member of the executive committee of the Imperial Cancer Research Fund on the nomination of the general committee of the Fund. It was reported that the Secretary of State had appointed Mr. W. Sampson Handley to be a member of the advisory committee on the administration of the Cruelty to Animals Act, 1876, in place of Sir Charters Symonds. It was reported that a legacy of £50, free of duty, for the laboratory fund of the College, had been bequeathed by the late Dr. F. W. Collingwood.

The Council considered the following resolution which was carried at the Annual Meeting of Fellows and Members on Nov. 19th: "That this forty-third annual meeting of Fellows and Members of the Royal College of Surgeons reaffirms that it is essential that Members, who constitute nine-tenths of the College, should be admitted to direct representation on the Council, especially having regard to the striking result of the poll of members taken last year." The following reply to the resolution was adopted: "The Council, having considered the report of the proceedings at the annual meeting of Fellows and Members, adhere to the opinion expressed at their meeting in January, 1931."

At the Primary Examination for the Fellowship held from Dec. 1st to 12th, 180 candidates presented themselves, of whom 53 were approved and 127 were rejected. The following are the names and medical schools of the successful candidates, viz.:—

S. W. Allinson, M.B. Lond., Univ. Coll.; A. W. Badenoch, M.D. Aberd., St. Mary's; G. T. Balean, Guy's; H. C. Barrett, M.B. N.Z., Otago; J. Bastow, M.D. Melb., Middlesex; G. H. Bateman, B.M. Oxf., King's Coll.; R. H. R. Belsey, St. Thomas's; M. J. Bennett-Jones, M.B. Liverp., Middlesex; J. G. Bowen, M.B. Lond., London; V. R. Clifton, M.B. Sydney, St. Mary's; R. B. W. A. Cole, Durham; A. L. d'Abreu, M.B. Birm., Middlesex; R. P. Dalal, M.B. Bombay Middlesex; R. S. de Bruyn, M.R.C.S., Guy's and Middlesex; Jean Marguerite Dollar, M.B. Lond., London (R.F.H.) Sch. of Med.; C. L. S. Duke, M.B. Sydney, Middlesex; R. S. Ellis-Brown, Guy's; F. I. Evans, Camb. and Guy's; W. J. Ferguson, M.B. Lond., Guy's; J. D. Fergusson, Camb. and St. Thomas's; E. O'D. C. Grattan, Camb. and St. Thomas's; A. Hilmy, Cairo and St. Bart.'s; J. E. Hughes, M.B. Adelaide, Middlesex; A. I. Hunter, M.B. N. Z., Otago; D. M. Jones, Cardiff and St. Bart.'s; L. E. Jones, St. Thomas's; B. L. Kapur, M.B. Punjab, Middlesex; A. McDowall, M.B. Edin., St. Mary's; D. B. McGavin, M.B. Camb., St. Bart.'s; A. H. McIndoe, M.B. N. Z.; Jocelyn Adelaide M. Moore, M.B. Lond., London (R.F.H.) Sch. Med. and Univ. Coll.; R. F. Mowll, King's Coll.; J. H. Moynihan, M.R.C.S., Charing Cross; C. S. Patel, M.B. Bombay, Bombay and Middlesex; P. H. L. Playfair, M.R.C.S., King's Coll. and St. Mary's; D. C. Price, M.B. Lond., St. Bart.'s; J. S. M. Robertson, M.B. Glasg., King's Coll.; M. A. Robertson, M.B. Camb., London; I. G. Robin, Camb. and Guy's; Enid H. Rockstro, M.B. Lond., Univ. Coll.; J. R. Rose, Camb.; B. J. Sanger, London; N. T. H. Schafer, M.B. Melb., London; G. M. A. Shaikh, M.B. Bombay, Middlesex; N. L. Shepherd, M.B. Lond., King's Coll.; T. T. Stamm, M.B. Lond., Guy's; D. M. Stern, M.B. Camb., London and Univ. Coll.; F. G. St.C. Strange, London; T. G. Tregaskis, St. Bart.'s; R. W. D. Turner, St. Thomas's; F. H. Weston, Guy's; C. W. K. Willard, Univ. Coll.; S. L. Wilson, M.B. N. Z., Otago.

University of London.

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B., B.S.

Honours.—(*a*, *c*) F. R. Dennison, King's Coll. Hosp.; (*a*, *b*) A. J. B. Goldsmith, Middlesex Hosp.; (*a*, *b*, *d*, *University Medal*) C. H. S. Harris, and (*d*) H. H. Langston, St. Bart.'s Hosp.

(*a*) Distinguished in Medicine. (*b*) Distinguished in Pathology. (*c*) Distinguished in Forensic Medicine. (*d*) Distinguished in Surgery.

Pass.—I. S. Acres, London Hosp.; J. H. Attwood, St. Bart.'s Hosp.; Ellen M. Barnes, Univ. Coll. Hosp.; G. J. Bell, Charing Cross Hosp.; P. S. Bell, Westminster Hosp.; H. W. Benham, Univ. Coll. Hosp.; R. C. Bennett, St. Bart.'s Hosp.; David Bielenky, Westminster Hosp.; K. C. Buck, St. Mary's Hosp.; E. H. Capel, Middlesex Hosp.; Anthony Caplan, St. Bart.'s Hosp.; W. I. Card, St. Thomas's Hosp.; Rachel P. Carr, Roy. Free Hosp.; F. W. Chippindale, Guy's Hosp.; A. B. Cook, St. Bart.'s Hosp.; Margaret E. Cope, Roy. Free Hosp.; H. E. B. Curjel, St. Thomas's Hosp.; J. O. F. Davies, Middlesex Hosp.; S. B. Dimson, Univ. Coll. Hosp.; J. A. Doherty, Univ. of Durham; E. H. Evans, Univ. Coll. Cardiff and Univ. Coll. Hosp.; R. E. M. Fawcett, St. Bart.'s Hosp.; P. B. Fernando, Ceylon Medical Coll. and Univ. Coll. Hosp.; J. F. Fisher, St. Bart.'s Hosp.; Phyllis M. Fraser, Roy. Free Hosp.; S. G. French, King's Coll. Hosp.; W. H. George, London Hosp.; B. W. Goldstone, St. Mary's Hosp.; Charlotte Gray, Univ. Coll. Hosp.; Bryneilen Griffiths, Univ. Coll. Cardiff and Charing Cross Hosp.; E. B. Grogono, London Hosp.; J. H. Gubbin, St. Bart's Hosp.; Eric Gwynne-Evans, Univ. Coll. Hosp.; Bernard Halfpenny, Middlesex Hosp.; J. T. P. Handy, Univ. Coll. Hosp.; A. R. C. Higham, St. George's Hosp.; J. M. Harker, London Hosp.; Erica M. R. Hutton, Roy. Free Hosp.; C. D. P. Jones, Univ. Coll. Hosp.; Alexander Kahan, St. Thomas's Hosp.; Betty M. Kemp, Roy. Free Hosp.; B. W. Knight and W. F. McGladdery, St. Bart.'s Hosp.; Dorothy Makepeace and K. S. May, King's Coll. Hosp.; E. R. R. Mellon, Guy's Hosp.; Ruth Milne, Roy. Free Hosp.; D. K. Mulvany, King's Coll. Hosp.; W. C. W. Nixon, St. Mary's Hosp.; R. J. L. O'Donoghue, Guy's Hosp.; R. M. Paton, St. Thomas's Hosp.; Oliver Plowright, Guy's Hosp.; W. M. Priest, Univ. Coll. Hosp.; Edward Renbom, St. Bart.'s Hosp.; J. M. Robertson, Guy's Hosp.; Phyllis M. Robottom, Westminster Hosp.; Ben Southwell, Guy's Hosp.; A. E. Stevens, London Hosp.; M. R. Thomas and W. J. Tindall, Univ. Coll. Hosp.; Margaret W. Trowell and Phyllis Wade, Roy. Free Hosp.; R. S. Wale, King's Coll. Hosp.; Joan B. Walker, Roy. Free Hosp.; F. L. Wheaton, Middlesex Hosp.; Mary J. Wilmers, King's Coll. Hosp.; and Dorothy Woodman, Roy. Free Hosp.

The following students have passed in one of the two groups of subjects.

Group I.—J. F. E. Bloss, St. Thomas's Hosp.; E. F. Claridge, London Hosp.; Barbara G. C. Clarke and R. C. Cohen, Univ. Coll. Hosp.; K. V. Earle, St. Thomas's Hosp.; Mary Evans, King's Coll. Hosp.; J. T. Griffiths, Univ. Coll. Hosp.; L. J. Hackett, St. Bart.'s Hosp.; Florence D. Hawes, Roy. Free Hosp.; C. B. Hinkley, St. Thomas's Hosp.; L. A. Hiscock, St. Bart.'s Hosp.; Janet Y. Laidlow, Roy. Free Hosp.; William Ogden, St. Bart.'s Hosp.; H. J. C. Page, St. Mary's Hosp.; S. R. C. Price, King's Coll. Hosp.; L. K. Robson, Guy's Hosp.; A. G. Sanders, St. Thomas's Hosp.; Margaret Skelton, Univ. Coll. Hosp.; D. G. Snell and R. G. W. Southern, St. Thomas's Hosp.; Winifred P. Thomas, Univ. Coll. Hosp.; R. S. Trueman, St. Bart.'s Hosp.; Margherita N. Walden, Roy. Free Hosp.; and Shirley E. Whitaker, Univ. Coll. Hosp.

Group II.—A. E. Bowling, Univ. of Leeds; M. L. Bynoe, King's Coll. Hosp.; R. F. M. Child, St. Mary's Hosp.; N. E. D. de Silva and G. W. Duncan, Univ. Coll. Hosp.; David Erskine, Guy's Hosp.; H. E. Harding, London Hosp.; G. F. Henderson and G. H. Pearce, Univ. Coll. Hosp.; D. A. Smith, St. Bart.'s Hosp.; W. W. Walther, Univ. Coll. Hosp.; and A. L. Wingfield, St. Thomas's Hosp.

Victoria University of Manchester.

At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B. AND CH.B.

Margaret M. Bodoano, G. B. Carter, Jane Druker, Benjamin Dunkerley, G. H. M. Franklin, K. P. Giles, Jessie Goldstone,

J. K. Hadfield, Neville Harburn, Gerald Maizels, and Alice Speight.

Part I.—A. C. Ashton, Thomas Chadderton, C. H. Gattie, B. H. Gillbanks, Marion W. Perry, and Muriel N. Strange.

FINAL EXAMINATION FOR B.D.S.

Second Class Honours.—J. L. Torkington.

FINAL EXAMINATION FOR DIPLOMA IN DENTISTRY.

F. R. Morrey and I. R. Stronach.

Royal Society of Medicine.

The President and Mrs. Watts Eden received Fellows and their guests at a social evening at the Society's house in Wimpole-street, on Monday last. A Russian film, the Roof of the World, was reassuringly introduced by the President as neither medical nor scientific, and proved to portray the adventures of a Russo-German expedition sent out from Soviet Turkestan. They set off with 80 tons of luggage on strings of camels and overloaded pack horses, and after a long trek over the rocky passes of two mountain ranges made a camp in a high valley, whence a smaller expedition proceeded on foot to climb Mount Lenin. After this the film showed nothing but ice and rock and crevasses, with never a plant except a constant thistle which turned out to be a piece of fluff in the projector. The photography was beautiful and the performance all too short.

The Society's house and library will be closed from Wednesday, Dec. 23rd, to Saturday, the 26th, both days inclusive.

Royal Institute of Public Health.

A course of lectures on Rheumatism and Arthritis as a Public Health Problem will be given at this institute, 37, Russell-square, London, W.C., at 4 P.M. on Wednesdays from Jan. 20th to Feb. 24th inclusive. The lecturers will be Sir William Willcox, Dr. R. Fortescue Fox, Dr. D. M. Connan, Dr. M. B. Ray, Dr. A. R. Neligan, and Dr. W. S. C. Copeman. At the end of the course there will be a demonstration at the British Red Cross Society's Clinic for Rheumatic Diseases on March 2nd at 11 A.M.

Instruction for D.P.H.

A three months' course of lectures and demonstrations on clinical practice and in hospital administration will be given at the Brook Hospital, Shooter's Hill, Woolwich, S.E. 18, by Dr. J. B. Byles, the medical superintendent, on Tuesdays and Fridays at 3 P.M., and alternate Saturdays at 11 A.M., from Tuesday, Jan. 5th, 1932. Particulars may be had from the Medical Officer of Health, London County Council, Public Health Department (Special Hospitals), Victoria Embankment, E.C. 4.

Institute of Medical Psychology.

Twenty lectures on Psychological Types and Mechanisms will be given in connexion with this Institute (formerly the Tavistock-square Clinic for Functional Nervous Disorders) at Friends' House, Euston-road, London, N.W., on Wednesdays, from Jan. 20th, 1932. Two lectures will be given on each day, the first by Dr. E. Graham Howe (3–4 P.M.), and the second by Dr. H. G. Crichton Miller (4.30–5.30 P.M.). The course is open to members of the medical profession only. Particulars may be had from the hon. lecture secretary at the Institute, 51, Tavistock-square, W.C. 1.

St. Mary's Hospital: Western Reunion.

Former students of St. Mary's Hospital, London, are holding a Western Reunion under the chairmanship of Dr. J. Odery Symes, on Saturday, Dec. 19th, at the Grand Pump Room Hotel, Bath, where a dinner will be held at 7 P.M. The Spa Committee have invited all visitors to a demonstration of methods of treatment at the Baths on the following Sunday morning, and to a tour of the Roman Baths. St. Mary's Hospital Rugby XV are playing Bath on the Saturday afternoon. The hon. secretary of the Reunion is Dr. J. Hobart Nixon, of Oakleigh, Chippenham.

Fellowship of Medicine and Post-Graduate Medical Association.

A course of lectures on Treatment will be given at the rooms of the Medical Society of London, 11, Chandos-street, W., on Wednesdays at 4 P.M. from Jan. 13th. A course of six lectures on Endocrinology will be given by Dr. Langdon Brown at the same place on Mondays and Fridays at 8.30 P.M. from Jan. 11th. Dr. Bernard Schlesinger will give a lecture-demonstration on Rheumatic Infection and Heart Disease in Children at the Children's Heart Hospital, West Wickham, Kent, on Saturday, Jan. 2nd, from 10.30 to 12 noon. Applications must be received not later than Dec. 28th. In future all special courses and lectures arranged by the Fellowship will be open only to its members. The address is 1, Wimpole-street, London, W.1.

Hospital Fees at Bradford.

About a year ago a scheme was formed at Bradford under which trade-unions, friendly societies, and other bodies undertook to contribute 1*s.* per head per year to the St. Luke's General Hospital on behalf of their members, so that in case of illness a working man or any of his family might receive free treatment both during illness and convalescence. This payment having been found inadequate the contributory bodies are being informed that it is necessary to increase it to 2*s.* 6*d.*

Dreadnought Hospital "Christmas Draw."

For the last eight years a "Christmas draw" has been organised on behalf of this hospital, and for the current one 60,000 sixpenny tickets had been sold when Scotland Yard last week issued a warning that if the enterprise were continued a prosecution would follow. It had been hoped by this means to raise £2000 for the purchase of two new ambulances, and the committee have expressed the hope that ticket holders will allow their money to remain.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Dec. 21st.—10 A.M., Gynæcological Wards; Genito-urinary Operations; Skin Department. 11 A.M., Surgical Wards. 2 P.M., Surgical Wards: Medical, Surgical, Eye, and Gynæcological Out-patients.

TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Demonstration: Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Demonstration. 2 P.M., Operations; Medical, Surgical, and Throat Out-patients.

WEDNESDAY.—10 A.M., Medical Wards; Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. 2.30 P.M., Gynæcological Operations. 4.45 P.M., Venereal Diseases Demonstration.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical Surgical, Eye, and Genito-urinary Out-patients. 2.30 P.M., Operations.

Appointments

CAMPBELL, A., McC., M.B., Ch.B. Glasg., M.O.H., has been appointed a Medical Referee under the Workmen's Compensation Act for the Island of Islay, Argyll.

Certifying Surgeons under the Factory and Workshop Acts: HEWITT, R. C., M.B., Ch.B. Camb. (Northwich); LEWIS, E. W., M.B., Ch.B. Edin. (Heytesbury, Wiltshire); and SMORFITT, F. A., L.R.C.P., L.R.C.S. Edin., L.R.F.P.S.G. (Southam, Warwick).

Births, Marriages, and Deaths

BIRTHS.

EARLY.—On Dec. 7th, in London, the wife of Captain E. P. N. M. Early, I.M.S., of a daughter.

HORSFORD.—On Dec. 13th, at Harley-street, W., the wife of Cyril Horsford, M.D., F.R.C.S., of a daughter.

MARRIAGES.

COPE—ANDERSON.—On Dec. 5th, at the United Methodist Church, Mallinson-road, Wandsworth, Albert Ernest Cope, M.D., to Augusta Margaret Anderson.

WHITE—QUILTER.—On Dec. 2nd, at St. John's Church, Crowborough, Norman L. White, F.R.C.S., of University College Hospital, London, to Sylvia Mary Quilter, of Cobs, Guernsey.

DEATHS.

GIBBONS.—On Dec. 12th, at Folkestone, Lister Gibbons, M.R.C.S., L.R.C.P., aged 67 years.

RALPH.—On Dec. 6th, at Boulevard Thiers, St. Jean-de-Luz (B.P.), Charles Hugh Danson Ralph, M.R.C.S., L.R.C.P., late Colonial Medical Service (Gold Coast and Cyprus), aged 66 years.

RANKIN.—On Dec. 11th, at Harley-street, Nicol McNicoll Rankin, M.C., M.B., Ch.B.

WILSON.—On Dec. 10th, 1931, in his 80th year, at 40, Part-street, Southport, David Wilson, M.D. Glasgow, Hon. Maj. R.A.F., late of Paddock, Huddersfield.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

NEOLITHIC MAN AND THE PENETRATION OF THE LIVING HUMAN SKULL.[1]

By T. Wilson Parry, M.A., M.D., F.S.A.

[Dr. Parry said that he would relate briefly the results obtained by a series of experiments undertaken on skulls (recent and dry) for the purpose of discovering the methods employed by Neolithic man, when operating upon the living human being, with implements fashioned out of the most primitive materials. In connexion with the nomenclature of operations performed in the late Neolithic period, he said that the words "trephining" or "trephination" "trepanning" or "trepanation," were used wholly oblivious of the fact that these terms imply that the operation of making a hole in the skull was performed by a metal instrument, a "trephine" or a "trepan," as the case might be, whereas in Neolithic times this operation was carried out many centuries before iron was discovered. He thought that a distinctive name should be employed so that the reader would understand readily when the primitive operation was under discussion. The word "craniotrypesis," being the Greek equivalent for simply making a hole in the cranium without specifying by what manner, has been coined in America, but the lecturer had come to prefer the word "holing" as being the simplest, clearest, and best English representation of this elemental procedure.

Dr. Parry then showed slides illustrating "some of the creations and customs of late Neolithic man, in order to catch a breath of the atmosphere of his culture and life." The slides represented (1) exquisitely worked arrow-heads, most of them finely barbed; (2) a flint dagger, two beautifully made saws, a sickle, and a chisel; (3) a finely shaped round-bottomed bowl, dredged from the Thames at Hedsor, 7 in. wide by 5 in. high, twisted sinew markings; (4), (5), (6) stone avenues at Carnac in Brittany, nearer view, and close up; (7), (8) Stonehenge (reconstructed), and as it is now; (9) burial in a long barrow (reconstructed); (10) a two-chambered tumulus (Denmark); (11) interior of a long barrow (W. Kennet, Avebury); (12) Trevethy Cromlech (near Liskeard, Cornwall); (13) Dolmen des Marchands, Lockmariaquer, Carnac; (14) section and plan of Dolmen des Marchands; (15) end-stone of the same dolmen.

He continued:]

Reasons for the Primitive Operations.

Why did Neolithic man, even when surgery was in such a primitive condition, feel compelled to attempt so momentous an operation? One can tell by the study of a series of specimens of Neolithic man's handiwork that the operator did not approach his work in a light-hearted manner, but that he fully appreciated the importance and, I may say, the seriousness of his undertaking. It was not so much the case of surgery having risen to a supreme height which stimulated such a proceeding, but the urging necessity of an all-important religious rite that dominated the position.

When showing you the stone avenues, circles, and dolmens of the Carnac region of Brittany, I must have impressed you with the atmosphere of religious life that pervaded this great centre, and this operation was initiated and developed as a religious rite for ridding an affected individual of some demon or demons that were supposed to have taken "posession" of him.

The disease, or I ought to call it the "disorder" of epilepsy was, I am convinced, the first indication, to members of a tribe, of any special individual being possessed of a devil. For those who have never seen anyone in an epileptic fit, I cannot do better than refer to the description of one, which I have no doubt is familiar, as it appears in the New Testament.

"And one of the multitude answered and said, 'Master, I have brought unto thee my son, which hath a dumb spirit and wheresoever he taketh him, he teareth him; and he foameth and gnasheth his teeth and pineth away.' And they brought the boy to Him and when he saw him straightway the spirit tore him and he fell on the ground and wallowed foaming.

"And Christ asked his father 'How long is it ago since this came under him?' And he said, 'Of a child and ofttimes it hath cast him into the fire and into the waters to destroy him.'

"When Jesus saw that the people came running together He rebuked the foul spirit and the spirit cried and rent him sore and came out of him and he was as one dead, insomuch that many said 'He is dead.' But Jesus took him by the hand and lifted him up and he arose."

To those who have witnessed an epileptic fit, this dramatic description, recorded nearly 2000 years ago, will bring before the mind, vividly and realistically, a picture of this condition. First comes the "epileptic cry," followed by contortions of the face, rolling of the eyes, and foaming of the mouth, with convulsions of the limbs. It is not unreasonable to think that a paroxysm of such a nature might have given anyone, in those days, the idea that an evil spirit was in the cranium of the victim and was clamouring vainly to free itself from its imprisonment. What should be done in such a case? The answer comes almost spontaneously—"Make a hole in the skull of the afflicted one and set the demon at liberty." Could anything be more logical to anyone holding such opinions?

Such large numbers of "holed" skulls of the ritualistic type have been unearthed in different parts of France that it is quite impossible to believe that the many individuals represented by this mass of material should have suffered from epilepsy and epilepsy alone. I feel there can be little doubt that this unique operative procedure, begun as it was for the dispelling of the epilepsy-demon, became instituted as a rite for the casting out of other devils. The next class of demons to be tackled would be represented, as we medicals would say, by such disorders that gave "head-symptoms," such as persistent chronic headache, migraine, chronic neuralgia with acute exacerbations, alarming attacks of giddiness, with or without singing in the ears, and distracting noises of the head. With any of these exasperating disorders, from the patient's viewpoint, it is reasonable to think that he would be only too willing to submit himself to a kill-or-cure treatment, to obtain alleviation from his malady, or permanent insensibility from it by death. I cannot believe that this spiritual treatment would stop even there, but that this rite would have been eventually extended for the extirpation of all devils that "flesh is heir to." The Carnac man that possessed a mind superior to his fellows might feel that this rite was a definite means of cleansing himself from every kind of devil, at the same time winning for himself spiritual purification.

Mention must just be made of amulets of the human skull which have been frequently found in relationship with "holed" skulls in dolmens in different parts of France. Prunières, a general medical practitioner, of Marvejols, in the department of La Lozère, France, was the first to draw attention to this association, and Broca was the first to offer a reasoned explanation of this relationship. It appears that when a man died whose skull had been perforated for ritualistic reasons, his tomb was entered and pieces of his skull, each containing a portion of the healed operation ring of bone, were sawn off with a flint saw, and these were regarded as most sacred relics. Some of these were grooved, and some were holed for suspensory reasons, so that they could be worn round the neck of their owner. Up to about 4/5 of the cicatrised bone circle was some-

[1] A lecture delivered before the Cambridge University Anthropological Society on Nov. 18th.

times removed in portions, and these portions were taken, but there was always at least 1/5 part left on the skull. The removed portions were replaced by other bits of skulls from other tombs, fewer always than those taken, and sometimes sawn pieces not even containing any evidence of an operation having been performed at all. This was done so that the spirit of the robbed corpse might not feel disgruntled and take revenge by haunting those that had deprived him of his lawful glorification.

Technique of the Primitive Operations.

By a series of nearly 50 experiments on the human skull I have been enabled to gain some practical experience of the methods adopted by men of the later period of stone-culture for "opening the skull" with primitive implements. I have been able to make out four distinct methods employed by primitive operators for this proceeding. I propose giving some details of each of these methods, illustrating each by examples of Neolithic skulls that have been treated in the manner I describe.

(1) *Scraping the Bone.*—The first, the simplest and by far the most common method, was by scraping a hole in the skull with a sharp-pointed flake of flint. Where flint was not indigenous, as in volcanic regions, flakes of obsidian or rhyolite glass were substituted. I may here add that in the South Pacific Islands shell used to be used at times, and after the white man's visit to some of these islands where he introduced glass bottles, bits of glass were chipped into shape, and these made excellent implements for scraping purposes. Whichever of these four materials be employed, they are all used precisely in the same way. The flint or obsidian flake is held between the thumb and index-finger of the right hand, and scratches are made in a single line on the chosen site of the operation. These scratches quickly fashion a groove, and the sides of the groove have next to be attacked, when this single furrow becomes converted into a basin-like elipse. This is deepened and widened till the diploë is disclosed, and further deepened till the inner table of the skull is reached. The point of the flint-flake is now used as a probe to test the depth of the vitreous or inner table. The primitive surgeon is able to tell when this is reached by a peculiar crackling of this glass-like layer which warns him that he must proceed cautiously, so as not to injure the dura mater. The primitive operator became eminently skilful by his careful procedure, as is evidenced by the very large number of skulls discovered which show perfect holes and healthy healing of the bone, verifying a successful operation. This method was found to be suitable for the making of small holes in the skull, and these are usually found to be either circular or oval in shape. An example of this method is illustrated by the "Thames" specimen dredged from this river at a spot just above where Hammersmith Bridge now stands. Here are two examples from France. I show you one successful case and another one clearly demonstrating a septic periosteitis, which appears, however, to have eventually recovered. I show you specimens from the South Pacific Islands—the holes of which were scraped with obsidian flakes; also one from Egypt (Dynastic period) which exhibits a depressed fracture which has been treated by sawing away the depressed portion and trimming the edges by scraping with a flint flake. The Egyptians for long after the predynastic period would not suffer metal to touch either a living or a dead body—indeed, they used to employ stone knives and flint saws in the process of embalming. I also show you specimens of Inca origin. One has three openings, and another shows evidence of five well-formed holes which I think may be regarded as a champion specimen that has beaten every other record in this respect.

(2) *The "Push-plough" method.*—For the making of larger and sometimes even gigantic holes in the living skull, I am convinced that the scraping method could never have been employed. It would be too tedious for the operator (as well as for the operatee), and much too dangerous. It has been a subject of considerable question as to how these very large openings were made. Two methods could have been employed. The first of these methods I believe to have been the following. An unfinished operation on a skull discovered at Peniche in Portugal gave me a clue as to what might have been done. You will see at a glance that this rather large elliptical incision was probably done by running the sharp point of a flint implement in a forward direction, away from the operator. Ploughing the land is usually done by horses or oxen pulling the plough to cut a groove in the soil; this would be done by pushing the implement in a forward direction to cut a furrow in the bone. For this reason I have given the name of "push-plough" to this method. Scratches would first be made on the path to be furrowed, and then the pushing forward of the sharp-pointed flint implement would wear away the outer table of the skull on the lines previously indicated. I show you slides of three stages in this operation. The first makes the lines of incision through the outer table; the second through the diploë up to the internal table, and the third shows the removal of the large rondel of the bone to produce an opening similar to those found in dolmens in different parts of France. I show you an English, a French, and a prehistoric Peruvian (Inca) skull which I believe have been treated in this way.

(3) *Boring and Sawing the Bone.*—Another method of removing either large or smaller portions of the skull was brought about by the double action of boring and sawing the bone. Holes were bored in a circle, closely packed together, and the partitions between the holes were sawn or rasped through, so as to form eventually a ring of incision and permit subsequent removal of a rondel of bone. This could have been done either by hafted hand-borers or by mechanical borers. Hand boring holes in a bone is a most tedious thing, and I cannot believe this was often or even ever employed. A mechanical borer consisting of a flint point, hafted into a wooden shaft, was most probably used. This implement, the bow-drill, is one of the oldest kinds of mechanical contrivances, and it has been suggested that it was used before bows and arrows were invented, and, indeed, it was it that gave man the idea of shooting arrows from a bow. I will show you an Inca skull that has been operated upon by this means. Another method of boring was employed in the South Pacific Islands when a shark's tooth, hafted into a shaft, was used. A shark's tooth makes an ideal "trephine," as the edges on the tooth are serrated, are very strong, and they have a flange which prevents the tooth from penetrating too deeply into the bone to the damage of the dura mater. Holes would be bored in a circle, as with the flint-pointed bow-drill, the partitions between the holes being sawn through either by means of an obsidian flake or with the serrated edge of the shark's tooth itself, and the rondel could then be easily removed.

Surgery of the Incas.

(4) *Sawing the Bone.*—The fourth and last method employed by primitive surgeons for removing a portion of bone was employed, as far as I can tell, only by the Inca races in prehistoric Peru. It must be remembered that the age of stone-culture in Peru did not end till very late. It was in the year A.D. 1532 that Pizarro, a Spanish adventurer, with a small band of Spaniards, treacherously conquered the Incas, by pretending to be friends, and then turning upon them and murdering them with their guns; the Incas not having seen such weapons before were paralysed into submission. The only metals known to this nation at that time were gold and silver which were, of course, useless for implements of any importance. The Incas were great surgeons, and with stone implements did all their surgical operations on the human skull, as regards fractures, with

astonishing daring. They operated also for disorders of the head, for such cases as gave "head symptoms," as probably continuous headache, giddiness, epilepsy, and kindred disorders, but there is no proof they ever operated, as in Neolithic France, for ritualistic reasons. Not a single human amulet has ever been discovered in Peru, and this is strong evidence that they did not believe in the extirpation of evil spirits in this way. Indeed, the religion of the ancient Peruvians was far in advance of this. They believed "in a Great Spirit, the Creator of the Universe, who being a spirit could not be represented by any image or symbol, nor be made to dwell in a temple made with hands. They also believed in the existence of the soul hereafter, and in the resurrection of the body." They regarded the body after death as a sacred thing, and would not permit mutilation of any part of it; hence the reason no human amulet has ever been found. Hence the great difference between them and the men of Neolithic France—their motives for this operation being absolutely and widely different.

The operation to which I refer was one of pure sawing. With stone saws they made a figure on the cranium resembling that made by a diagram resorted to when playing the game of "naughts and crosses." This removed a square button of bone, but was a most dangerous operation, not a single instance has come down to us of recovery. Indeed, the Squier "Inca" skull was the first example of the kind that was brought over to Europe and created much wonder wherever it was shown. Both Nélaton and Broca examined it and concluded that the patient had only survived the operation from 7 to 15 days, as the degree of reparation of the bone was small and the man must have died within this specified time. Squier brought the skull to Europe in the year 1867, so that it is yet barely 65 years since it was recognised that cranial surgery was attempted, from what ever motive, by man in his state of stone-culture.

WILLIAM BUDD, F.R.S.

Dr. E. W. Goodall read a paper on this pioneer epidemiologist before the Epidemiological Section of the Royal Society of Medicine on Nov. 27th, telling that he was the son of Samuel Budd a physician practising at North Tawton in Somerset, was born in 1811, and had eight brothers, of whom seven became doctors and five graduated at Cambridge with honours. George, three years older than William, succeeded Sir Thomas Watson as professor of physic at King's College and became, like William ultimately, a Fellow of the Royal Society. William Budd was educated at Bristol, Paris, and London, and graduated at Edinburgh with a gold medal for his thesis on rheumatism. He practised for seven years at North Tawton and then moved to Bristol where he became physician to the Infirmary and a teacher in the medical school. He was very active in the British Medical Association, and delivered the address in medicine at the Bristol meeting of 1863. He had a good knowledge of French, German, and Italian, was a good draughtsman and photographer, and succeeded in practice. In 1840 he wrote an essay to prove that typhus and typhoid fevers were distinct diseases, both contagious, but not arising spontaneously. This essay failed to get a prize from the examiners, but his chief work thereafter was along those lines.

The medical problem of Budd's time, said Dr. Goodall, was contagion, generally acknowledged as the cause of the infectious fevers. But was it single or were there many contagia, and what was their nature? Budd held there were many and that the contagia were alive; for they bred true, had their individual incubation periods, protected only against themselves, when introduced spread gradually, and might be induced by inoculation, as in smallpox. That the preceding case cannot always be recognised in Budd's view proved nothing for only in 5 per cent. of small-pox cases was this traced, and none believed that gonorrhœa ever arose de novo. Quarantine was useful, so contagion did not come by a miasma. Murchison thought typhoid arose by putrefaction of filth, and he carried medical opinion with him for a while. Budd had not enough skill to prove his view by the microscope, but we now accept his theory, and also his suggestion that phthisis is contagious. In each case he was twenty years before his time. He zealously promoted pure water supplies, retired in 1873, and died at Clevedon in 1880.

Vacancies

For further information refer to the advertisement columns.

Accrington, Victoria Hospital.—H.S. £150.
Birkenhead County Borough.—Res. Asst. M.O. £350.
Birmingham, Midland Hospital, Easy-row.—H.S. £150.
Brecon, Breconshire C. C.—County M.O.H. £800.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120. Also H.S. £150.
Bristol General Hospital.—Two H.P.'s. Two H.S.'s. Res. Obstet. O. H.S. to Spec. Depts. Each at rate of £80. Also Cas. H.S. At rate of £100.
British Post-Graduate Medical School, Whitehall, S.W.—Dean. £1800.
Burnley, Victoria Hospital.—Two H.S.'s. Each at rate of £150.
Bury Infirmary, Lancs.—Third H.S. At rate of £150.
Calcutta Medical College.—Prof. of Pathology, &c. Rs.800 a month.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £120 and £100.
Dreadnought Hospital, Greenwich.—Physician.
Edinburgh Royal Infirmary.—Jun. Asst. Radiologist. £350.
Golden-square Throat, Nose, and Ear Hospital, W.—H.S. £100.
Harrogate, Royal Bath Hospital.—Res. M.O. At rate of £156.
Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150.
Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—Surg.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res H.P. At rate of £100. Also Surg. to Ear, Nose, and Throat Dept.
Hull Royal Infirmary.—Third H.S. At rate of £150.
Indian Medical Service.—European Officers.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £120.
Khartoum, Wellcome Tropical Research Laboratories.—Bacteriologist. £E.660.
King Edward Memorial Hospital, Ealing.—Sen. Res. M.O. £250.
Lanark, Roadmeetings Hospital, Carluke.—Res. Phys. Supt. £350.
Liverpool, St. Paul's Eye Hospital, Oldhall-street.—H.S. At rate of £145.
L.C.C. Hospitals.—Asst. M.O.'s. Each £250.
London Lock Hospital, 91, Dean-street, Oxford-street, W.—H.S. At rate of £200.
Manchester, Ancoats Hospital.—Med. Reg.
Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. £120.
Manchester, St. Mary's Hospital.—H.S. for Whitworth Park Branch. At rate of £50.
Middlesbrough, St. Luke's Hospital, Grove Hill.—Asst. M.O. and Deputy Res. Supt. £500.
Oldham, Royal Infirmary.—H.P. and Cas. O. At rate of £175.
Queen's Hospital for Children, Hackney-road, E.—H.S. and Cas. O. Each at rate of £100.
Radium Institute, Riding House-street, W.—H.S. At rate of £150.
Rotherham Hospital.—Cas. H.S. £150.
Rotherham, Oakwood Hall Sanatorium.—Asst. M.O. £300.
Royal Earlswood Institution, Redhill, Surrey.—Jun. Asst. M.O. At rate of £250.
Royal Eye Hospital, St. George's Circus, S.E.—Three L.C.C. Refraction Appts. Each £80.
St. Mary's Hospital for Women and Children, Plaistow, E.—Hon. Clin. Assts.
St. Mary's Hospital, W.—Med. Supt. £400. Also Med. Reg. £200.
St. Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—Clin. Asst. 3 guineas.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Hon. Asst. Surg.
St. Thomas's Hospital.—Two Asst. Surgs. to Ear, Nose, and Throat Dept.
Salford City Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.
Salisbury General Infirmary.—Two H.S.'s. Each £150.
Salvation Army, Mothers' Hospital, Lower Clapton-road, E.—Jun. Res. M.O. At rate of £60.
Sheffield, Jessop Hospital for Women.—H.S. At rate of £100.
Sheffield Royal Infirmary.—Ophth. H.S., Asst. Aural and Ophth. H.S., and Asst. Cas. O. Each at rate of £80.
Sheffield, Winter-street Hospital.—Asst. Tuber. O. £350.
South Eastern Hospital for Children, Sydenham, S.E.—Res. M.O. At rate of £100.
Stockport Infirmary.—Res. Surg. O. and H.P. £250 and £175 respectively.
Swansea General and Eye Hospital.—Cas. O. £200.
Woolwich and District War Memorial Hospital, Shooters-hill, S.E.—H.P. and H.S. Each at rate of £100.